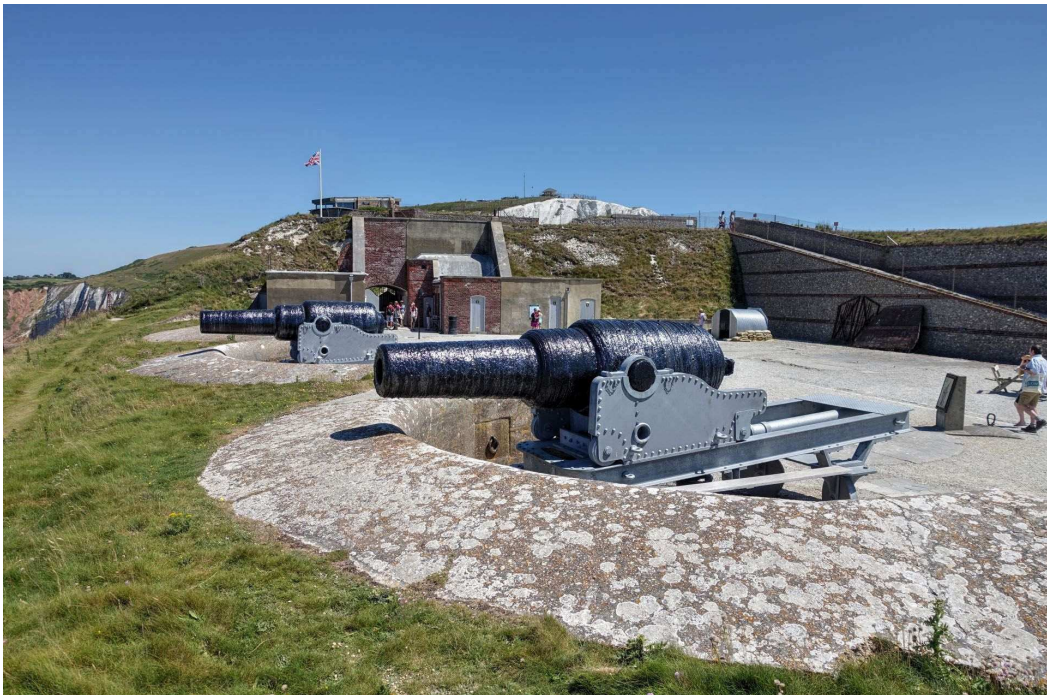
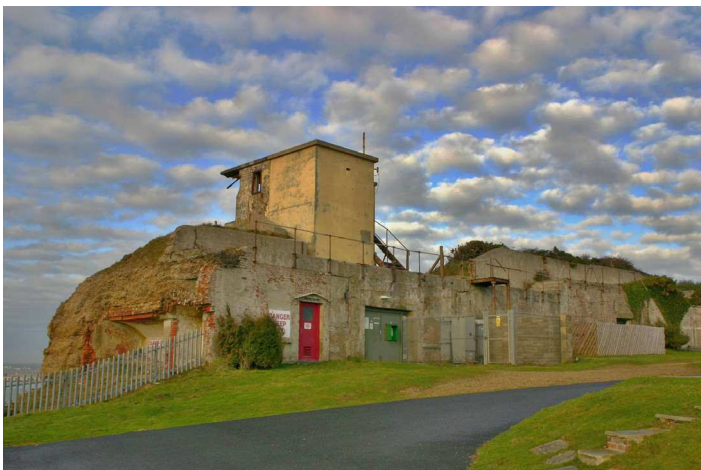


Solent Papers No.2

The Needles Defences



**Anthony Cantwell MA
and Peter Sprack**



Above Left: Freshwater Redoubt:
12pr Q.F. Battery with 15pr QF field gun
emplacements between. 2003

Above Right: Hatherwood Battery:
Remains of gun emplacements. 2018

Left: Cliff End Battery:
Battery Observation Post on old Gun
Emplacement 2007

Below: Cliff End Battery 2012

Bottom Left : Freshwater Redoubt Cookhouse
and Stores 2003

Bottom Right: Freshwater Redoubt Caponier



Solent Papers Number Two

The Needles Defences 1525 -1956

by Anthony Cantwell MA and Peter Sprack



Cliff End Fort (Fort Albert) showing the Brennan Torpedo Establishment (now demolished)

Acknowledgements

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- No. 3 Fort Nelson and the Portsdown Forts
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Errata

- Page 2, para 2, line 11 - Append after 'six 24-pounder smooth-bores' that Hurst Castle's armament in 1805 was six 24-pounder and eighteen 9-pounder smooth bore guns.
- Page 3, para 1, line 7 - *Gloire* was not the first armoured warship using iron plates. The *Gloire* was the first ocean going warship launched to combine steam propulsion with armoured plate armour cladding. Although launched in 1859, she was not commissioned into service until August 1860. Her superiority was soon overtaken by HMS *Warrior*, the first iron hulled ocean-going warship commissioned in August 1861.
- Page 3, para 2, line 1 - The Royal Commission appointed to consider the defences of the United Kingdom was formed in August 1859 and soon recognised that the Royal Navy was the nation's front-line defence but needed secure bases from which to operate.
- Page 3, para 3, line 1 - £2,800,000 is wrong. The Royal Commission's initial estimate for Portsmouth was £2,400,000 but before it received Parliamentary approval, it was whittled down to £1,920,000 with cost-cutting of some of the proposed fortifications. By 1865, with works underway, Portsmouth's estimate had increased to £2,223,000. This estimate had increased by the end of 1868 to £2,623,534, exclusive of armoured shields and armaments.
- Page 3, para 3, line 6 - 'an effective range of no more than 3,000 yards' should read 'an effective range of about 1,000-yards (914m), although a maximum range of 3,000-yards could be achieved, its chances of hitting the target were poor'.
- Page 3, para 4, line 13 - 'fortified barracks' should read 'fort'.
- Page 4, para 1, line 8 - 'Hatherwood Point Battery' should have been included in this list.
- Page 4, para 1, line 19 - 'By 1869 ...' should read 'The official cost report shows that up to 30th June 1868 a total of £171,722 had been spent on the new works and £16,638 on the Military Road'.
- Page 4, para 1, line 21 - 'It was estimated that the total cost would eventual reach £300,000 (twice the original estimate' should read 'The report gave a revised estimate that the total cost for the new works upon completion would be £217,937 and £16,728 for the Military Road. This being exclusive of the iron shields and guns, which had yet to be decided'.
- Page 4, para 1, line 23 - '£18' should read '£18-5-0'.
- Page 4, para 1, line 24 - The last sentence should read 'The increase in costings was down to required structural changes caused by the rapid improvements and increased sizes of the armaments during the 1860s and also having to deal with unstable land at the sites for Warden Point and Cliff End.'
- Page 5, para 2, line 1 - '1850's' should read 'late 1850s'.
- Page 5, para 4, line 1 - '1870' should read '1880'.
- Page 5, para 4, line 2 - 'smokeless' should read 'slow burning'.
- Page 6, para 2, line 1 - 'BL and QF guns but not until about 1900' should read 'QF guns from circa 1890 and BL guns from 1900'.
- Page 7, para 2, line 3 - 'Depression Position Finder (DPF)' should read 'Depression Range Finder (DRF)'.
- Page 7, para 2, line 5 - 'placed in an armoured cell' should read 'mounted on a masonry pillar'.
- Page 8, para 4, line 2 - 'Hatherwood Battery had been eroded away' should read 'Hatherwood Battery had been reduced to a practise battery'.
- Page 8, para 4, line 13 - The last sentence should read 'The Owen Committee review of 1905 declared the four 6-inch guns at Warden Point superfluous. They were removed by April 1907'.

- Page 8, para 5, line 12 - Append 'as running past guns mounted in Reserve'.
- Page 10, para 4, line 4 - '25th July 1901' should read '25th June 1901'.
- Page 10, para 5, line 2 - 'from Fort Albert' should read 'from Fort Albert and mounted in 1922'.
- Page 11, plan - N should read 'Lamp passage' and it should be located on the plan in the corridor to the rear of J and K.
- Page 11, para 2, line 15 - '24 men in war time' should read '24 men in time of need'.
- Page 11, para 3, line 4 - 'five Mark III, one Mark IV which had longer range' should read 'five Mark II and a Mark IV'.
- Page 11, para 3, line 5 - 'These were retained until 1903, by which time they were obsolete' should read 'These old guns were reduced to practise guns by 1895 and were withdrawn in 1901'.
- Page 12, para 1, line 11 - 'but a sentry beam searchlight was installed in 1899 and used in World War 1' should read 'In the 1890s two fixed beam (sentry) search lights and a concentrated moving search light were installed into this lower gallery. By 1908 they had been reduced to a reserve status and were reactivated during World War 1 as two concentrated moving search lights. A review of 1927 declared the searchlights obsolete as "*they light an area not covered by armaments and tended to confuse navigation!*"
- Page 12, para 1, line 19 - '150°F in an hour' should read '150°F within an hour's operation'.
- Page 12, plan - The 1860 Needles Battery plan is missing the magazine location which was built within the rampart behind the guardroom.
- Page 13, plan - 'I Ramp to top of mound' should read 'I Ramp to top of rampart'.
- Page 13, plan - 'J Shell and Cartridge Stores under mound' should read 'J Shell and Cartridge Stores under rampart'.
- Page 13, plan - 'L Site of 1pdr AA Gun 1913' should read 'L Site of experimental 1-pr QF pom-pom AA Gun'.
- Page 13, plan - 'S' should be located on the plan in two places: Firstly, adjacent to R, and also at the northern end of the rampart.
- Page 14, para 1, line 5 - 'by a destroyer' should read 'by a destroyer. This experimental AA gun was removed before World War 1.'
- Page 14, para 3, line 7 - 'Semi-underground' should read 'Underground'.
- Page 14, para 3, line 9 - 'Two 9.2 inch Mark IX were emplaced in 1900 on Mark III mountings, and a third added in 1904' should read 'Two 9.2-inch BL Mark IX guns were eventually installed in 1900 on Mark III mountings, and a third added in 1903'.
- Page 15, para 4, line 12 - 'so by 1900 the old work had been abandoned' should read 'in 1899 the decision was taken to reduce the status to that of a practice battery. Consequently, the left-hand side was remodelled for two 5-inch BL guns on Vavasseur mountings. In 1901, the centre portion of the battery was remodelled to take two more 5-inch BL guns on Vavasseur mountings. By around 1906 the battery ceased its practice role and was disarmed and abandoned.'
- Page 15, para 4, line 14 - 'Erosion and demolition have left the battery today just a jumble of granite and concrete.' Should say 'Despite damage caused by landslip and demolition, the emplacements for the 5-inch BL guns can still be discerned today. However, the rest of the battery has been demolished.'

- Page 16, para 1, line 7 - '£6,000 of the £13,000 devoted to construction was spent on proper drainage of the 100 feet (30.5m) -high cliff and the building of a retaining sea wall at its base to prevent soil erosion.' Should read 'building work was delayed as the site had to be stabilised and prepared with £5,570 worth of works, this consisting drainage work over 23 acres and also the building of a 1,100-foot sea wall. The cost of the battery on top of this was £7,329.'
- Page 17, lower plan - 'N -Battery Command Post' is missing on the plan, it should be located with E.
- Page 18, para 2, line 12 - Remove 'in 1910'.
- Page 18, para 3, last 18 - 'Sold off in 1957 as a holiday camp, it has now been demolished to make way for a housing complex.' Should say 'In April 1958 Warden Point Battery was sold at auction to become a holiday camp. The holiday camp closed in 1991 and in 1995 the site was bought by a property developer for the construction of an estate of houses. The holiday camp buildings were demolished and house building commenced, but before the main part of the battery could be developed a serious landslide occurred in 2012, which rendered the site untenable. Today the site is derelict and abandoned, it has no Historic England listed building scheduled status.'
- Page 18, para 5, line 7 - 'This was still going on in 1870 and is the main reason why no guns were emplaced until 1877.' Should say 'After allowing time to monitor the ground conditions a contractor was employed to build an earthwork battery for nine 9-inch guns in 1871. Six of these guns were delivered to the battery in 1872, but before they could be mounted a decision was taken to mount heavier guns at the battery and the guns were returned to the ordnance depot.'
- Page 18, para 5, line 9 - 'Originally intended for 9-inch RMLs, the battery was actually armed' should say 'the batteries gun emplacements were then rebuilt to take heavier guns and in 1877 the battery was finally armed'.
- Page 18, para 5, line 12 - Remove 'so the delay was probably beneficial'.
- Page 18, para 5, line 15 - 'now useless guardhouse nevertheless survived' should say '1856 defensible barracks provided accommodation for caretaker staff'.
- Page 20, plan - 'A' for 6-inch gun should be added to the next 3 emplacements in addition to the one marked.
'K Fire Station' should say 'K Fire Engine House'.
'S' should be added to the plan on the right-hand side of Fort Albert.
'T' should be added to the plan on the left-hand side of Fort Albert and the pier redrawn to show its full length. The key should have 'T Pier'.
- Page 21, para 4 - Replace the whole paragraph with:
'In November 1859 the fort was extensively tested with all of the fort's guns being fired for a two-hour period. Following the test, it was recorded that the structure stood up well. In 1862 the fort's armaments were upgraded with the 68-pounder smooth bore guns being replaced with modern 7-inch 'Armstrong' RBL guns. With other local batteries becoming active with heavier armaments, the armaments at Cliff End Fort were reduced to just the six 7-inch RBLs and two 8-inch Howitzers in 1872.
- Page 21, para 5, line 1 - 'In 1886-88 the fort was' should read 'In 1886-88 the fort was disarmed and'.
- Page 21, para 5, line 11 - 'The northern two-thirds of the fort was filled to the roof with sea sand to protect the torpedo installation from naval gun fire' should read 'The northern five casemates on all floors had their embrasures closed by mass concrete and the casemates completely filled with sand and shingle. These filled casemates then acted as bomb-proof traverses protecting the rear of the torpedo station'.

- Page 21, para 5, line 13 - 'The remaining casemates' should read 'The remaining two casemates on each floor'.
- Page 22, para 1, line 1 - Remove 'The flooded basement was filled with shingle'.
- Page 22, para 2, line 9 - 'A plan to build a second launching ramp and engine room that year was abandoned as the weapon was too short in range for coast defence against modern battleship. Manufacture of the torpedo was closed down' should read:
'The Owen Committee review of the defences in 1905 declared all Brennan Torpedo Stations as being unsuitable at night, too slow to operate and comparatively short ranged compared to artillery. They therefore recommended the removal of all Brennan Torpedo Stations from the fixed defences. Following this recommendation the establishment at Cliff End Fort was closed down.'
- Page 22, para 3, line 8 - 'as a practice battery' should read 'as the practice battery for the gunnery school at Golden Hill Fort'.
- Page 22, para 3, line 25 - 'Although the idea was abandoned in 1948, the guns and searchlights were not sold off until 1957.' Should read 'In 1957 Coast Artillery was disbanded, and the equipment was removed from the fort. The derelict fort was sold at auction in 1962 together with the cliff top Cliff End Battery.'
- Page 23, para 2, line 3 - '16281' should read '1681'.
- Page 23, para 4, line 2 - 'invasion scares of the 1840s.' Should read 'the perceived invasion threat from France when Louis Napoleon seized power in 1851.'
- Page 23, para 4, line 8 - The sentence 'By 1856 Hurst Castle mounted fifteen 8-inch SB shell guns, fourteen 32-pounder SBs and two 32-pounder carronades'. Should be moved to the end of the paragraph as most of this armament was installed within the newly erected earth work batteries.
- Page 23, para 4, line 12 - '8-inch shell guns' should read 'traversing gun emplacements'.
- Page 24, para 1, line 5 - 'the solution adopted was to overwhelm them with guns protected within granite casemates to which wrought-iron front plates were later added.' Should read 'the solution recommended was to overwhelm an attacker with gun fire from six batteries and eighty-one guns, the low-lying Hurst was to be augmented with granite casemates for 31 guns. They estimated the cost of these new fortifications to be £150,000.'
- Page 24, para 2, line 2 - 'Although £108,000 had originally been estimated as the cost, over £140,000 had been spent by 1886 on the superstructure alone.' Should read 'By 1865 the estimate for the revised plan at Hurst Castle had risen to £108,000. A report dated 1875 stated that the actual cost of the fortifications at Hurst had been £111,421-19-0'.
- Page 24, para 2, line 5 - Remove 'Eventually, nearly £80,000 had to be spent additionally to provide the wrought iron shields for the casement fronts.'
- Page 24, para 2, line 7 - 'Indeed, the' should read 'The'.
- Page 24, para 4 and 5 - Replace both paragraphs with:
'Although the revised plan for Hurst Castle was a total of sixty-one gun casemates, by 1873 only forty-one casemates had been armed with 9-inch RML 12-ton guns and fitted with iron armoured shields. The additional cost of the forty-one shields amounted to £79,719, these consisted of three 5-inch iron armoured plates laminated with brick & asphalt, all mounted on concrete filled iron shield frames. The other twenty casemates had been blocked up with granite walls backed by concrete and internal masonry walls. Towards the end of the 1870s the decision was taken to mount heavier guns at Hurst Castle. This required reworking the casemates. By 1880 the Castle was armed with ten 12.5-inch 38-ton RMLs, twenty-three 10-inch 18-ton RMLs, five 9-inch 12-ton RMLs and six 64-pounder RMLs

(three of which were mounted in the old castle). By 1886 the total cost expended at Hurst Castle had been £211,070-17-9. In 1886 a decision was taken to further improve the defences at Hurst Castle. This involved dividing each of the Wings into a numerous smaller gun groups by completely filling twenty-five casemates with concrete to form shell proof traverses, protecting the guns on either side. Upon completion of this work the revised armament for the fortification was ten 12.5-inch 38-ton RMLs, fifteen 10-inch 18-ton RMLs, five 9-inch 12-ton RMLs and three 64-pounder RMLs (two of which were mounted in the old castle covering the rear of the fortification).

As well as the filling of gun casemates with concrete, the main magazines at each end of the wings were also altered to provide better protection with the infilling of rooms within the main magazines with concrete. The main magazine located within the basement of the old castle Keep was also strengthened with the pouring of a four-feet thick concrete slab across the floor above and a slab of nearly seven feet thick across the seaward facing courtyard outside. At this time the seaward facing bastion and curtain wall rooms of the old Henrician castle were also completely filled with concrete. The seven expense magazines of the West Wing were altered with the original cartridge stores being converted into shell stores and new cartridge stores being provided below ground under the existing magazines. '

Page 24, para 6 & onto page 26 - This paragraph should be replaced with:

'With the advancement of technology and the increased threat from fast motor torpedo boats, Hurst Castle was adapted to mount small calibre Quick Firing (QF) guns. The initial recommendation in 1886 was for six 6-pounder QF and three machine guns. This evolved into the provision of three 6-pr QF guns in a new concrete battery to attached to the outside of the east wing and three 3-pr QF guns and three machine guns on travelling carriages. These changes were in place by 1893. With the increase in size of fast attack craft, larger 12-pounder QF guns were mounted at Hurst, one on top of the Keep and two within concrete emplacements on the roof of the west wing. These were in place by 1902. To help deal with an attack at night, two searchlight emplacements were installed together with generators to produce the electric power needed.'

Page 25, plan -

Added to the 1880 Key should be:

Y 9-inch RML Gun

Z 64-pounder RML Gun.

On the plan the last gun on the east wing should be marked Z not Y.

On the plan there should be three Z emplacements shown on the seaward bastion of the old castle.

Page 26, para 2, line 6 -

'removed in 1918, the 12-pr QF and the searchlights in 1928, and the fort was demilitarised until 1939 and another war' Should read:

'removed in 1918. An armament review of 1927 recommended that a boom defence be constructed further up the Solent where the current was less than 2½ knots, which made the 12-pr QF defences at Hurst superfluous. The report additionally stated "*that it was desirable to abandon Hurst Castle, which is inconveniently situated and expensive to supply*". The Castle was disarmed shortly afterwards, but the abandonment of the site by the military was to be short as the outbreak of the Second World War in 1939 saw its reoccupation.'

Page 26, para 5, line 1 -

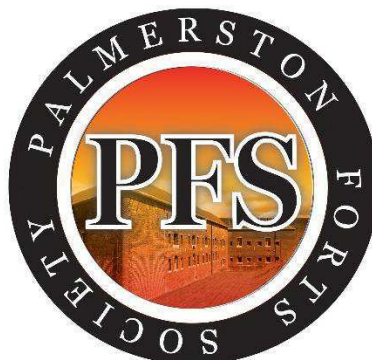
'The invasion scares of the 1840s led to this brick fort' should read 'The perceived invasion threat from France when Louis Napoleon seized power in 1851, led to the construction of this brick artillery fort'.

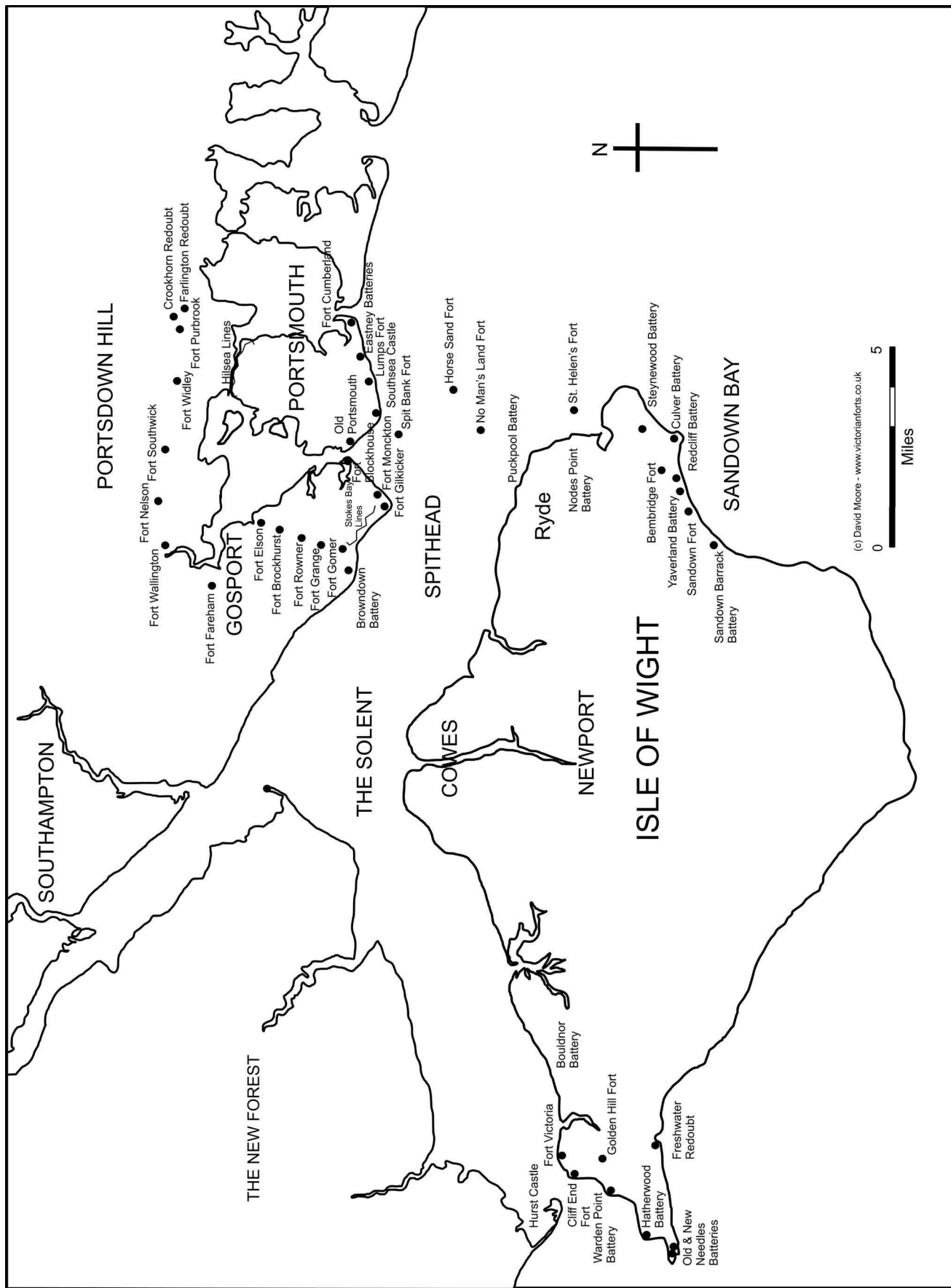
Page 26, para 5, line 3 -

'The original design suggests two casemated batteries meeting at an obtuse angle,' should read 'The first design for the fort, dated January 1852, was for a fourteen gun brick casemated battery arranged in two halves meeting at an obtuse angle, with a further battery of open gun emplacements positioned on the roof '.

- Page 26, para 5, line 5 - 'A diamond shaped plan was completed by a loop holed rear wall but the design was amended to save money.' Should read 'The diamond shaped trace was completed with a double storey gorge wall loop-holed for musketry defence split in half by an elaborate medieval styled gatehouse, all surrounded by a wet moat.'
- Page 26, para 5, line 8 - 'Instead,' should read 'A revised plan, dated April 1852, was for'.
- Page 26, para 7, line 1 - 'Rifled artillery soon made both Forts Victoria and Albert obsolescent, despite' should read 'Soon after the completion of its construction, the advent of more powerful rifled artillery made the brick structure of Fort Victoria obsolete. In 1859 the Royal Commissioners remarked about Fort Victoria that it was "*not of the most approved construction*". Despite'.
- Page 27, para 2, line 1 - 'An experimental see-saw searchlight pit was built west of the fort in 1888,' should read 'A see-saw searchlight emplacement was built west of the fort in 1888 to illuminate the minefield'.
- Page 28, plan - 'A Original casemates' should read 'A Original entrance'.
- Page 29, para 3, line 10 - '8-pounder SB' should read '9-pounder SB'.
- Page 29, para 3, line 11 - '1885' should read '1854'.
- Page 29, para 3, line 13 - 'Disarmed in 1885, it' should read 'Yarmouth Castle was reviewed by the 1859 Royal Commission with a recommendation that it be dismantled, it was however used for accommodation and'.
- Page 29, para 4, line 1 - 'This Battery for two 6-inch Mark VII BL guns was built in 1937-8 to cover a new Examination Anchorage east of Yarmouth.' Should say 'The 1927 defence review recommended that an anti-submarine Boom and Gate be erected from Egypt Point to Stansore Point. As a consequence, they also recommended that the Examination Anchorage be moved further east, with a new battery at Bouldner for two 6-inch Mk VII BL guns and the Examination Battery be built in place of the existing Examination Battery at Cliff End. Bouldner Battery was eventually built between 1937 and 1938.'
- Page 30, para 3, line 12 - 'yellow laburnum' should say 'yellow gorse'.
- Page 30, para 3, line 16 - 'designed in 1863, should say 'approved in April 1863'.
- Page 30, para 3, line 18 - Appended to the paragraph should be 'This would accommodate the garrisons for Warden Point and Cliff End Batteries'.
- Page 31, para 1, line 6 - 'installed after 1872' should say 'installed by 1886'.
- Page 31, para 3, line 2 - '1888 it also became' should say '1888 it became'.

D Williams March 2024





Part A: The History of the Batteries

Note: Words marked * are explained in the Glossary at the back when they first appear.

History, 1525 - 1870

The Isle of Wight is the key to the natural harbour of Portsmouth and the sheltered waters of the Solent. Since the Middle Ages, the growth of Portsmouth as a naval base and of Southampton as a major port has made the island a 'stepping stone' for invaders anxious to attack them. For centuries these attackers were usually Frenchmen whose most direct approach to the Solent lay from the east through the waters of Spithead. The Needles Passage is the 'back door' to the Solent, Southampton and Portsmouth. Nature has provided strong defences: the narrow ship channel is protected on the west by the lethal Shingles shoal and on the south by the underwater projection of the Needles Rocks. Where these 'pincers' meet, the western entrance to the channel (The Bridge) is only 1,500 yards (1,372 metres) wide. In the days of sail, the strong tides in the narrow approaches were a further hazard. Running at 3 knots off the Needles, they can increase to as much as 6 knots at Spring tides off Cliff End, where the projecting shingle bank of Hurst Spit narrows the channel again to 1,400 yards (1,280 metres) at the western entrance of the Solent.

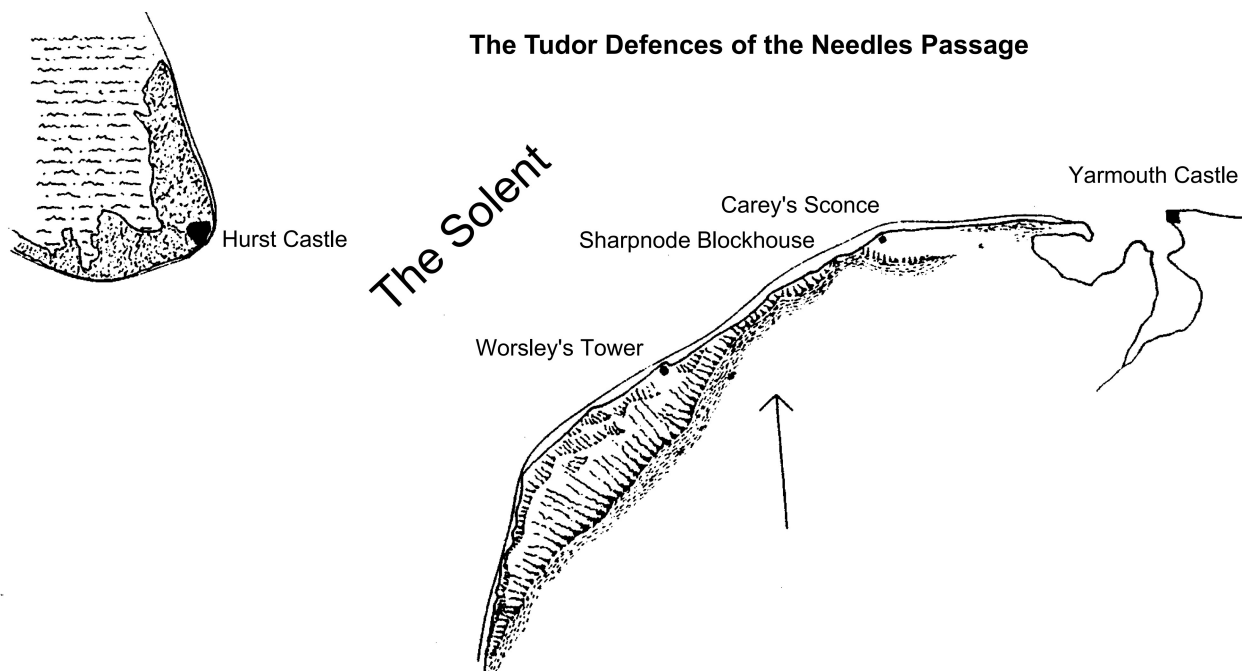
The speed of the tide complicated the defenders' task, for ships could sail quickly past Cliff End before the prevailing westerly wind, especially as the local phenomenon of the 'stand' or double high tide creates two separate high waters only an hour or two. apart. Once artillery was invented, the best solution was to erect batteries along the West Wight cliffs, but their unstable clays frequently subsided. Any water-level batteries would be lower than the gun decks of attacking ships and could be attacked from behind by enemy troops landed elsewhere on the island. Luckily, the River Yar virtually separates Freshwater 'Isle' from the rest of the Wight: if the land approaches at Yarmouth in the north and Freshwater in the south were secure, then

so were the western coast defences. Hence the 1629 suggestion to dig a defended ditch across the neck of land at Freshwater. Treacherous reefs of rock make the neighbouring southern beaches difficult landing places, while from the Needles to Cliff End the cliffs are often unbroken and easy to defend.

While the main missile weapon was the longbow, medieval raiders were hard to repel offshore. The French did great damage several times, especially in 1377 when they burned Newport and Newtown. To warn of their approach, beacons were maintained on high ground in the West Wight. Once cannon developed, however, coast defence became easier. A demi-cannon could fire a 32-pound (14.5 kg) iron ball up to a mile at maximum range. So an octagonal stone tower was built about 1525 east of Cliff End, where the ship channel comes close to the shore. Named after Sir James Worsley, it carried its guns on the roof but was overlooked by neighbouring high ground and was disused by 1570.

When Henry VIII was threatened with invasion in 1538 by both France and Spain, he built a chain of new forts along the south coast of England to cover harbours and landing places. So an earthwork was built on Hurst Spit in 1539, soon followed by a stone fort of 1541-44. Hurst Castle was composed of three low semi-circular towers called bastions*, joined by curtain walls and surrounding a higher central tower which mounted more guns. This design was soon overtaken by an Italian one incorporating arrow-headed bastions which covered the adjacent walls better with flanking fire. Yarmouth Castle and nearby Sharpnose Blockhouse were both built with arrow head bastions in 1547, the first of stone, the second of earth.

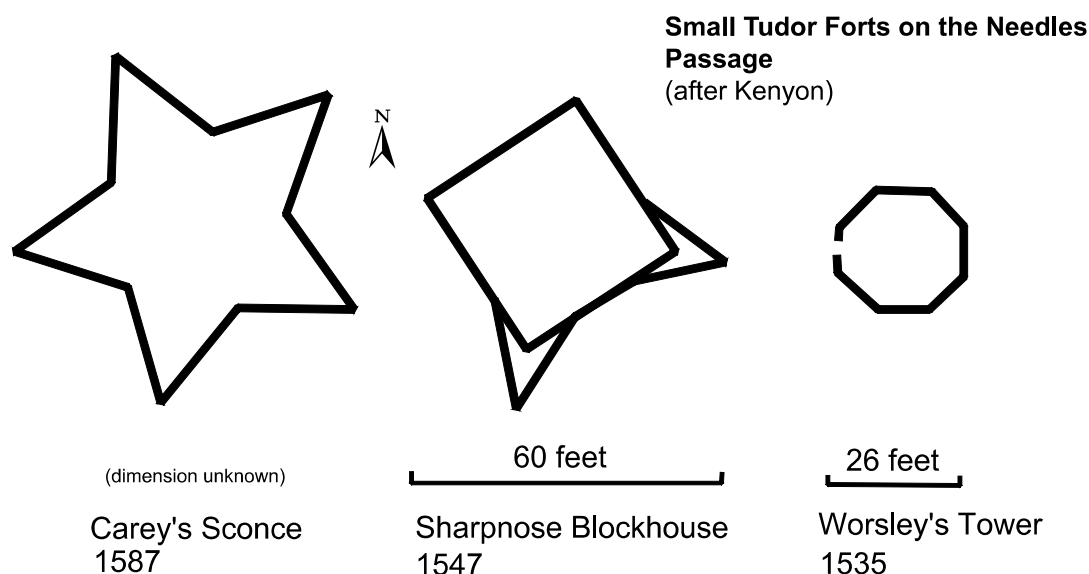
Both covered the sea channel east of Cliff End, while Yarmouth also protected the harbour and the north entrance to the Freshwater peninsula. Sharpnose was an earth square, whose simple triangular bastions faced inland to protect the seaward battery against fire from the high ground



south of the fort. After the Spanish Armada attacked in 1588, Sharpnode was rebuilt the next year and renamed Carey's Sconce* after Sir George Carey, the island's governor. This was a five-pointed star fort, again of earth faced with planks, and soon fell into disuse.

For the next two centuries the stone forts at Hurst and Yarmouth constituted the sole defences of the Needles Passage. When war with France broke-out in 1793 after the French revolution of 1789, both forts were repaired and earthen batteries were thrown-up in 1795 at Hurst. Certainly there were five earthen batteries on the Island side of the channel in 1803 but a scheme to enlarge the external batteries at Hurst was not carried out. The central tower of Hurst was vaulted in brick in 1803-6 to support the weight of six 24-pounder smooth-bores*. Barracks for infantry patrols were built at Colwell Bay and Compton and Grange Chines, while a battery of three 18-pounders covered Freshwater Bay. These defences assumed great importance in 1803-5 when Napoleon threatened invasion, but the earthwork batteries were disarmed after the war ended at Waterloo in 1815. Thereafter little attention was paid to the Needles defences until the 1840's.

Then there were several invasion scares caused by an active French foreign policy and by their building of propeller-driven steam warships to challenge our command of the English Channel. A new French revolution in 1848 and the seizure of power by Napoleon's nephew in 1851 created further tension. In 1850 it was proposed to increase the armament of Hurst Castle, but the Bonapartist 'coup' in December 1851 led to major works there which included two new exterior earthen batteries. In 1852-5 a triangular brick fort was built on the island shore at Sconce Point, on the site of previous earthen redoubts*. Christened Fort Victoria, it was probably derived from Russian designs at Sebastopol and was intended to co-operate with Hurst to cover the Needles Channel. A proposed offshore semi-circular fort at Warden Point to mount 41 guns was too expensive, so a smaller version called Fort Albert was built on the beach at Cliff End in 1854-56 which mounted its guns in four tiers like a 'brick battleship'. Both these island forts were vulnerable to land attack, so a permanent redoubt was built above Freshwater Bay in 1855-6 to cover the easiest landing place in Freshwater Isle.



All these forts mounted heavy smooth-bore guns which fired either roundshot or explosive spherical shells. Against French warships armed with the same types of gun they would have been good enough. At the end of the 1850's however, they were rendered obsolete by the introduction of new weapons of war. In 1859 France launched 'Gloire', the first warship to be armoured with iron plates. This made all our wooden-hulled battleships obsolete, which caused a new invasion panic, the building of British 'ironclads' and an official review of the state of our defences by a Royal Commission. Simultaneously the brick forts were menaced by the introduction of rifled* breech-loading guns which could rip their walls apart with elongated explosive shells. (See 'Changes in Armament' page 5).

The 1860 report of the Royal Commission on the Defences of the United Kingdom based national security on the fortification of major naval bases from which British ironclads could contest control of the English Channel with French invaders. It proposed to spend nearly £12 million (subsequently much reduced) on this task.

Of this £2,800,000 was to be expended on Portsmouth, then our main fleet base. Previously Portsmouth dockyard had been defended by nearby coastal batteries and land defences like the Hilsea

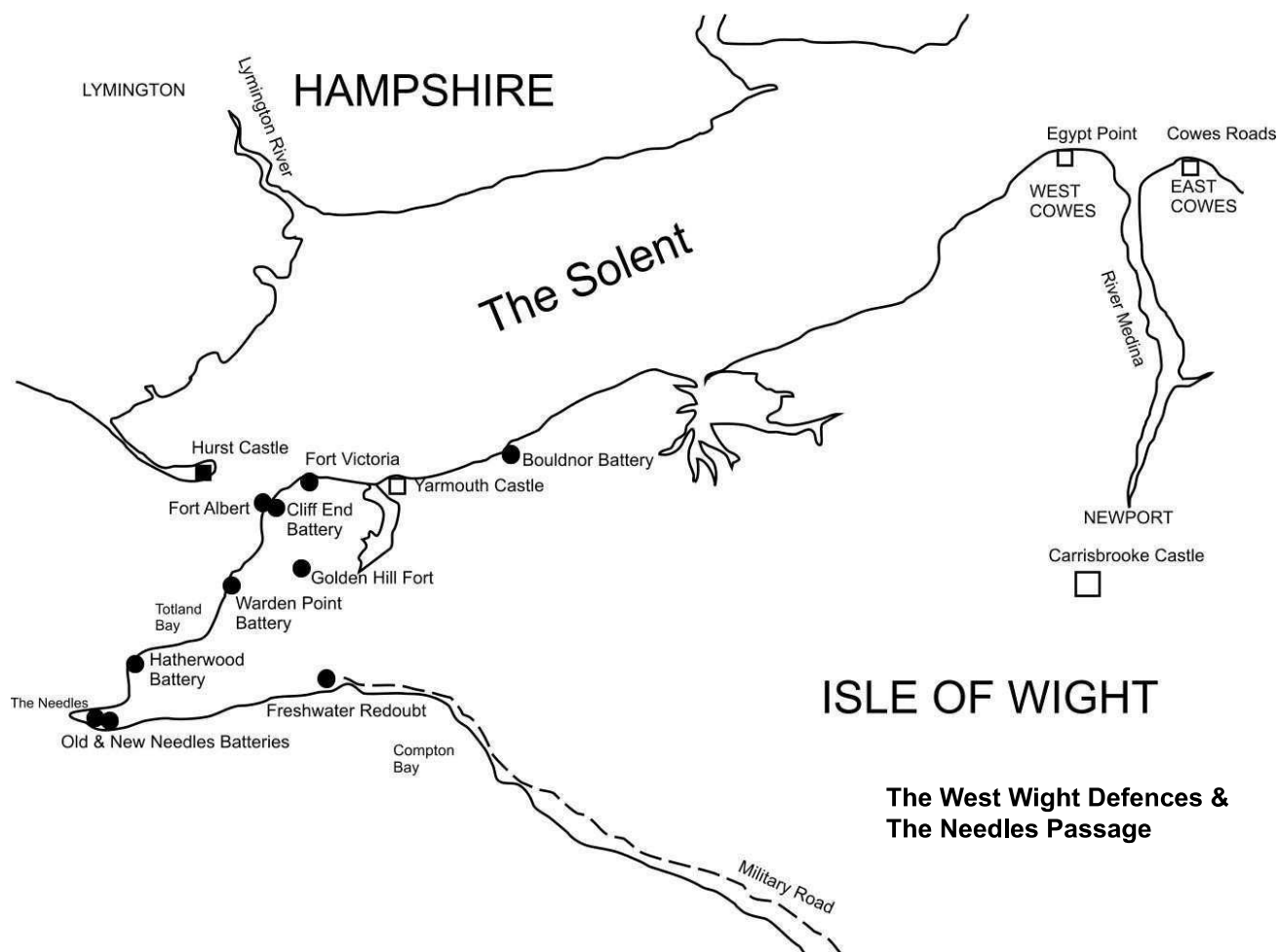
Lines when smooth-bore cannon had an effective range of no more than 3,000 yards (2,743 metres). The new rifled guns were thought to attain maximum ranges of over 8,000 yards (7,315 metres), raising the possibility that French troops might land along the coast and bombard the dockyard from the landward side.

As a result, Portsmouth was provided with a ring of land forts, new coast batteries and four sea forts in Spithead. Further batteries on the eastern Isle of Wight helped to bar the direct approach to Portsmouth from the east and to prevent invaders capturing the island by landing in Sandown Bay. The Needles Passage was harder to navigate, but it had to be defended as the 'back door' to the Solent, Portsmouth and the merchant shipping of Southampton. The proposed cost of the Portsmouth defences included £150,000 for modernising Hurst Castle and building four new batteries and a fortified barracks on the Island side for a total of 81 guns. A proposed system of strongpoints to guard the south-west coast was later abandoned on cost grounds, but a military road from Chale to Freshwater Bay would permit speedy reinforcement of threatened beaches.

Low-lying Hurst Castle was rebuilt with its guns in iron-fronted masonry casemates* either side of the Tudor fort which would protect them from

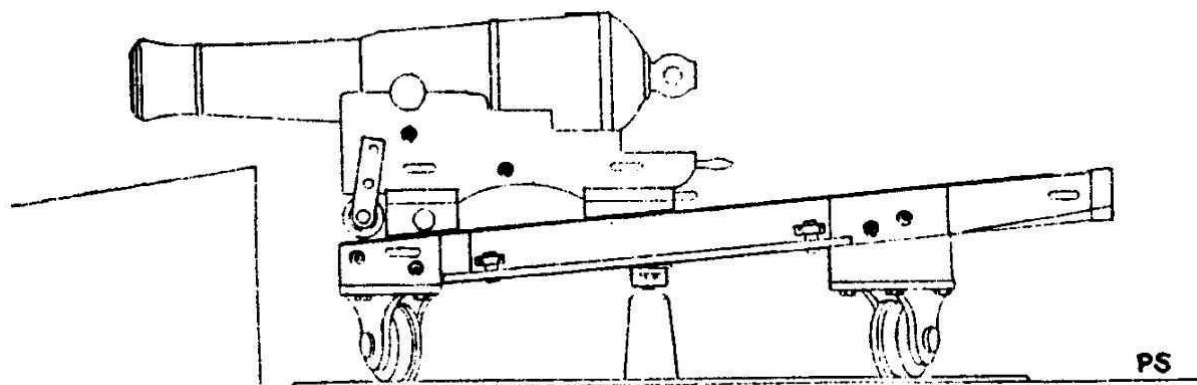


Hurst castle with its Tudor keep and Victorian wing battery



close-range naval gunfire. The new Island batteries were all open barbette* batteries in which the guns fired over the top of a low parapet. As they were positioned on clifftops, their guns could drop shells through the less-protected decks of ironclads whose return fire would probably sail over the top of the defences. These new batteries at Needles Point, Warden Point and Cliff End had only simple gorge* (rear) defences and were usually built in two or three years by private contractors under Royal Engineer supervision. Golden Hill Fort accommodated their garrisons in peacetime and mounted rooftop guns to cover the land approaches to Freshwater 'Isle' from the east. Freshwater

Redoubt continued its task of covering the only good beach on the south side of the triangular defensive perimeter formed by the English Channel, Needles Passage and River Yar. By 1869 over £170,000 had been spent on the six works and £17,000 on the Military Road: it was estimated that the total cost would eventually reach £300,000 (twice the original estimate), at a time when the gross pay of an army private was £18 a year. Much of this cost was the result of continually improving the size of gun and the thickness of iron shield at Hurst Castle as the penetrating power of artillery frequently increased.



68pr Smooth Bore Gun (1850) on C pivot Platform

Changes in Armament

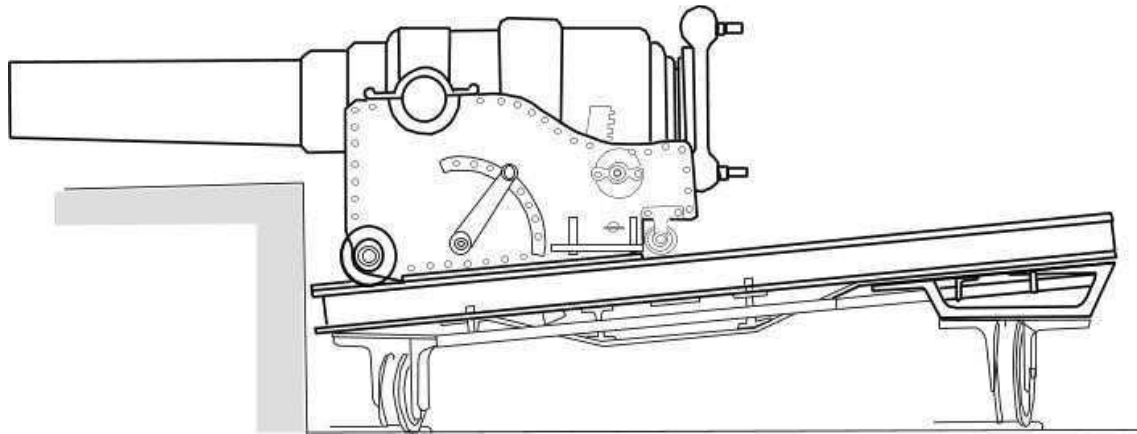
The coastal forts of Henry VIII were armed with muzzle-loading* brass or cast iron guns with exotic names like 'Falconet' (2-pounder) and 'Saker' (5-pounder), each mounted on a two-wheeled wooden carriage. These smooth-bore (SB) guns were simply horizontal tubes into which a propellant cartridge of gunpowder was loaded, followed by an iron cannon-ball. When both had been rammed down the bore* the gun was fired by applying a lighted match to a touch-hole at the top rear of the barrel. This ignited a thin train of powder which raced down to fire the cartridge.

Although smooth-bore cannon were developed to fire heavier shot, the basic design remained unchanged for another hundred years. To enable Victorian coast defence guns to traverse* more quickly to follow a passing ship their wooden carriages were stood on wooden traversing platforms which were fitted underneath with small iron wheels. These ran on curved iron tracks (racers) set in the floor of the gun emplacement. When the cannon was fired it recoiled up the slope of the platform for reloading. Solid iron shot was fired, sometimes heated in a furnace to set a wooden ship on fire. In the 1830's spherical explosive shells were introduced.

A major breakthrough came in the 1850's when William Armstrong and other engineers introduced rifled breech-loading guns (RBL). Armstrong's gun

was 'built-up' by heat-shrinking successive wrought-iron hoops around the basic barrel so that larger charges of gunpowder could be fired. 'Rifling' was the cutting of grooves into the inside of a gun barrel to impart spin to an elongated shell, coated with lead to engage in the grooves when fired. It was loaded through an opening breech at the rear of the gun, but exhaust gases corroded and loosened the breech, causing accidents and reducing the gun's range. Introduced in 1859, Armstrong guns could not easily penetrate warship armour and few appeared in the West Wight. Those mounted at Needles Point Battery between 1864 and 1869 could drop shells from the clifftop onto the vulnerable decks of warships. In 1866 the Army reverted to muzzle-loading, but they retained the rifling and 'built-up' system Armstrong had pioneered. Many of these rifled muzzle-loaders (RML) were emplaced in the Needles Passage batteries, mounted on iron or steel versions of the wooden carriage and traversing platform. Initially recoil was arrested by the meshing-together of friction plates on the upper and lower carriages but later a piston in a hydraulic cylinder brought the gun to a halt for reloading. Coast batteries used armour piercing shells against ironclads and 'common shell' to explode inside ships.

Around 1870 Britain returned to breech-loading (BL) guns. New types of smokeless powder were in use and needed long guns in which to develop their full force. Loading through a breech made life



7-inch Rifled Breech Loading Gun on Traversing Platform, Iron no.2

easier for the gunner for he no longer needed to expose his body to the enemy fire when loading and ramming, while the rate of fire also increased.

These new BL guns were constructed of steel and many entered service in the 1880's. At the same time, the danger posed to naval anchorages by the development of fast, steam-driven torpedo-boats running at about 30 knots led to quick-firing (QF) guns. These traversed quickly and could fire up to 25 shells a minute because the cartridge case was metal, so that a fresh charge could be loaded safely immediately after firing without washing out the embers which resulted from using bagged charges. In the smaller QF guns the shell was fixed to the cartridge case, simplifying loading. QF guns were fitted with an autosight, so that when the ship showed in the sight the gun was pointing at the target.

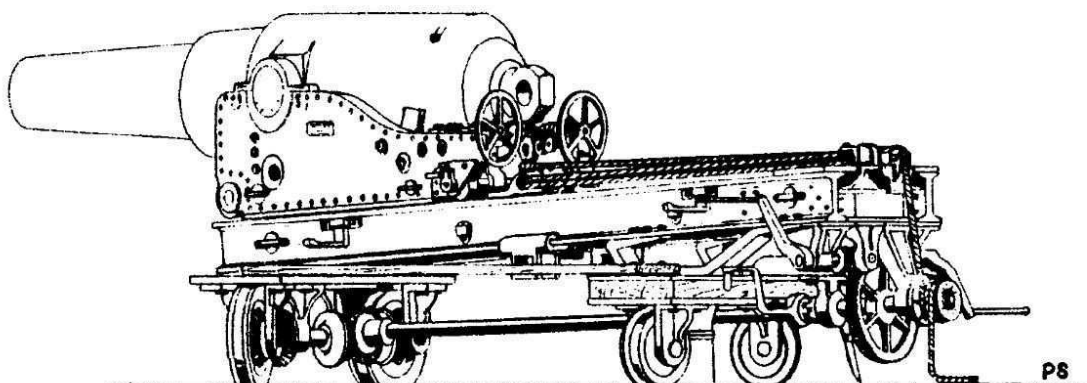
The West Wight batteries were armed with BL and QF guns but not until about 1900, after the Spithead forts were modernised. Yet guns were useless if they could not see at night, especially against small torpedo craft. Thus searchlights were developed in the 1880's, the power being supplied through dynamos from steam or oil engines in the rear of some coast batteries. The current produced an arc-light between two carbon rods mounted within a searchlight casing. A reflector behind the light projected the light outwards at an angle of 2° - 3° for a mile, but if it was traversed as a fighting-light it could only follow one target at a time. So these concentrated beams were used as sentry lights:

passage of an enemy vessel through the beam alerted the defenders.

Experiments in using searchlights on temporary mountings took place in the Needles Passage between 1889 and 1892. One problem considered was how to prevent enemy fire destroying the lights: one solution was the "see-saw" emplacement, built experimentally at Fort Victoria (where it still survives) and Warden Point. The light was attached to one end of a counterweighted girder sunk into a concrete pit. It could be 'exposed'* directly or swung down into the pit and its light reflected off a plane mirror at the other end of the girder.

This made it safe from enemy fire but the idea was too complex. When a chain of searchlight emplacements was built along the channel in 1898-99, one-storey concrete blockhouses with opening iron shutters were used to house the movable fighting lights. Many were converted to two storeys in 1914, with a shelter beneath.

If a dispersing lens was fitted to the front of the projector* the light came out in a fan. By placing a number of emplacements near each other the fans of light created an illuminated area. To eliminate the need for vulnerably wide openings in the emplacements, the parabola-ellipse reflector was introduced after 1897. This reflected the light convergently to a point just inside a narrow vertical slot so that it diverged to 16° , 30° or 45° outside.



9-inch Rifled Muzzle Loading Gun of 12 tons

on 'Dwarf' Carriage and Traversing Platform 'D' pivot mounting as at Old Needles

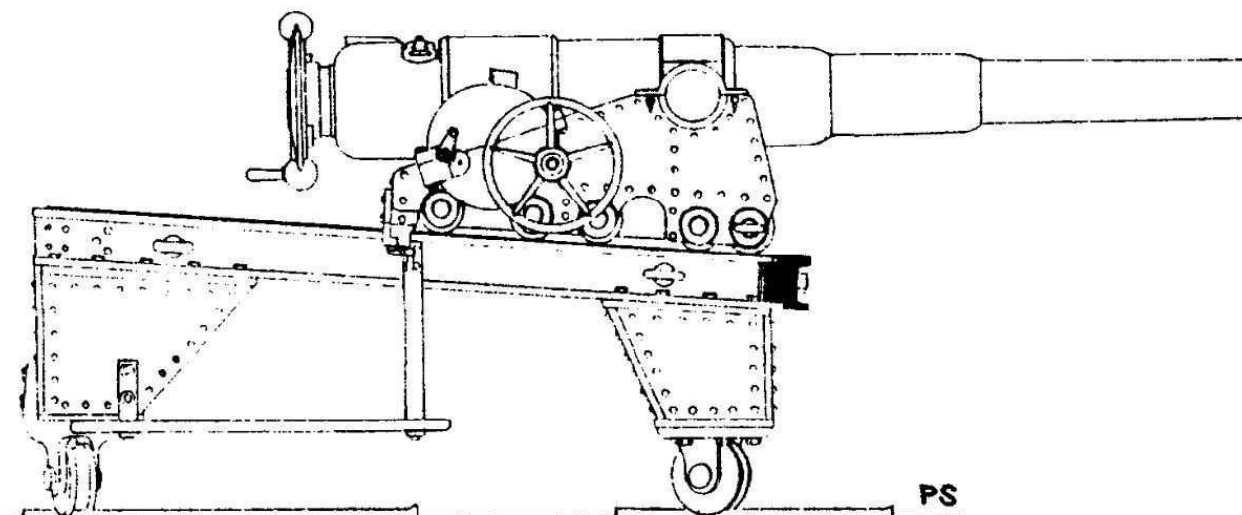
An example of this type of emplacement, 1939-45 vintage, can be found on the south bastion, Hurst Castle.

As gun ranges increased, so instruments were invented to make shooting more accurate. The most effective was Captain Watkin's Depression Position Finder (DPF), invented in 1879 and still in service in 1956. It was placed in an armoured cell some distance from the guns it served. The operator followed the target vessel with a telescope mounted above an area chart so that the ship's track was reproduced on the chart whenever the telescope was moved. The ship's forecast range and position were passed by cable to dials near the guns, which were aimed from this information. The Position Finder

operator made allowance for the time the shell would be in the air and the guns were fired when he predicted the shells would hit the ship if it held its previous course.

Later Works, 1870 to 1914

Once the batteries in the West Wight had been built and armed there were few changes until the 1890's. Improvements in armament were usually made to the more vulnerable approaches to Spithead. As a result, the Needles defences were soon full of 9 and 10-inch RML guns which lacked the penetrating power to pierce the increasingly thick armour plate of battleships. Frequent official proposals were made to install RML guns of larger calibre* but these were usually deferred pending the



40 pr Rifled Breech Loading Gun on Special Modified Traversing Platform for Golden Hill Fort

development of the new breech-loading steel guns (See "Changes in Armament"). When these were available Spithead again received priority. Hatherwood and Warden were experimentally fitted with two long-range 9-inch RMLs apiece in 1888 and 1892-3 respectively. Their carriages were designed to allow 35 degrees of elevation rather than the normal 10 degrees but this temporary expedient was soon abandoned as modern breech-loaders became available.

While modernisation of the gun armament had usually to wait until the later 1890's the narrowness of the channel made it suitable for more unorthodox weapons. Thus in 1888 Fort Albert was converted into a launching station for the Brennan torpedo. Invented in 1874 by the Australian Louis Brennan, this 24 foot (7.3 metres) long torpedo was propelled by two counter-rotating propellers driven by fine wire stored on two drums in the torpedo body. These wires were attached to a steam-driven winding engine at Fort Albert. The faster the wires came out of the torpedo, the faster it went. To turn the weapon the shore operator would vary the winding speeds of the drums in the fort. Range was 11 miles at a maximum of 30 mph (48 km PH) and the weapon was in service in coast defence until about 1906.

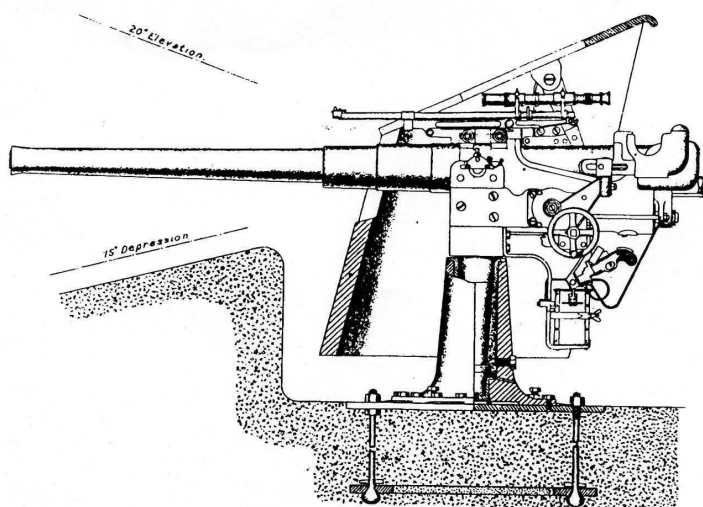
Fort Victoria, disarmed in 1876, became a depot for submarine mining in 1891. Until 1904 minefields in coastal waters were supervised by the Submarine Mining companies of the Royal Engineers. Mines were mainly of two kinds. The cylindrical Observation mines were laid on the sea bed in lines connected by electric cables. A shore observer could select the mines to be fired around the target, or a variant of the position finder would fire them automatically as the operator tracked the ship across the minefield. The spherical electro-contact (EC) mine was moored to float just below the surface in groups of four. If a ship struck a mine the shock either closed an electric circuit and exploded the charge or sent a signal by cable to a shore station called a test room where the operator could cancel firing if the vessel were friendly. The EC

mine had the advantage that it would function at night or in fog when observation might be impossible.

Improvement of the Needles Passage batteries took place between 1898 and 1903. By then Hatherwood Battery had been eroded away and Old Needles disarmed. Its replacement, New Needles Battery, mounted three 9.2-inch BL guns, as did Warden Point. Their role was counter-bombardment against battleships as they fired a 380-pound (172 kg) shell to a maximum range of 19,800 yards (18,105m) in the case of a Mark X on a Mark V mounting. 6-inch BL Mark VII guns were installed at Warden Point and Cliff End to deal with cruisers and blockships, with 4.7-inch QF guns at Cliff End and 12-pounder QF at Hurst Castle to combat torpedo boats. It was later felt that there were too many 6-inch guns for so narrow a channel and the four at Warden Point were placed in reserve in 1907.

In 1914 the battery armaments were:
 Freshwater Redoubt, two 6-pounder QF
 New Needles, three 9.2-inch BL MK IX
 Warden Point, three 9.2-inch BL MK X
 and four 6-inch BL MK VII (in reserve)
 Cliff End, four 6-inch BL MK VII
 and six 4.7-inch-QF
 Fort Albert, four 12-pounder QF
 as a practice battery
 Hurst Castle, three 12-pounder QF,
 three 6-pounder QF (practice)',
 six 12.5-inch RML and eleven 10-inch RML

After all this preparation and despite constant practice, all was quiet throughout the 1914-18 War. Sentries arrested the curious who trespassed near the barbed wire surrounding the batteries, but the German navy did not approach. When the guns fired in earnest on 2nd July 1915 their target tragically was a British tug, the "Handy", which ignored signals to identify herself. A crew member was killed and the tug was beached. At the end of the First World War, all the Island batteries were maintained in a state of readiness. Some, like Cliff End and Warden Point, were used for summer



12 pdr Quick Fire Breech Loading Gun 1895

both Hurst Castle and Fort Albert to deal with German torpedo craft (E-boats). The 'twin-six' could fire 120 hand-loaded shells per minute and was the ultimate light coast defence gun. As in the previous war the ship channel was illuminated by groups of searchlights, but a major bonus to the defenders (530 Coast Regiment, Royal Artillery, TA) was the introduction of Coast Defence Chain Home Low radar at New Needles in 1941. This could plot ships and low-flying aircraft and was so secret that 700 land mines were laid across the Needles headland and infantry defenders moved in to prevent a German gliderborne raid. In fact the New Needles was the only battery

training camps for Territorial* gunners. More guns were removed and little modernisation was done: the narrowness and difficulty of the ship channel was still reckoned its best defence. The sole major innovation was the building of a new permanent battery east of Yarmouth at Bouldnor in 1937. Its two 6-inch guns were to cover a new Examination Anchorage where suspect ships in wartime could be examined under the guns of a nearby battery, a task formerly performed by Cliff End.

When the Second World War began in 1939 the battery armaments were: New Needles, two 9.2-inch BL; Cliff End, two 4.7-inch QF and two 6-inch BL; Fort Albert, two 12-pounder QF; Hurst Castle, no guns; Bouldnor, two 6-inch BL. Warden Point had been disarmed in 1936 and acted as an area night command post.

The fall of France and the possibility of invasion in 1940 forced improvements. During the aerial Battle of Britain, steel or concrete covers were erected over the guns to protect the gunners from fighter 'strafing'*. Hatherwood became a Royal Navy indicator loop station: the loop was an electric cable laid on the sea bed which signalled the passage of submarines or torpedo boats across it. Also in 1940 a minefield activated from the shore was laid off Bouldnor Battery. Torpedo tubes were placed on Fort Victoria pier to destroy German landing ships. In 1941 two twin 6-pounder guns were mounted at

in the area fire command to shoot at known enemy naval targets: on two occasions in 1943 it drove off E-boats waiting for British convoys off Bournemouth but could claim no hits. Vigilance was always maintained: as late as June 1944 the navy expected desperate German blockship attacks on the exits of the Solent which might seal-in the vast invasion fleet gathered there to invade France on D-Day.

At the end of the war in 1945 the area defences were again placed in care and maintenance*, although Bouldnor was reactivated in 1951 with the last two 6-inch guns from Cliff End and used for training. New Needles was closed-down in 1952 but was converted in 1956 into a rocket-engine testing site. The twin-sixes at Fort Albert and Hurst and the two 6-inch at Bouldnor remained in place until Coast Artillery was wound up in 1956, whereupon all equipment was stripped and sold.

Fort Victoria and Golden Hill remained in the hands of the Royal Army Service Corps for waterborne transport training until 1962. Most of the other sites either became holiday camps or were partially or completely destroyed by developers or vandals. Only now is an attempt being made to preserve buildings and chart the history of the batteries.

Part B: A Gazetteer of the Batteries

1. Freshwater Redoubt (Ordnance Survey ref: SZ 345 856)

Freshwater Bay is about 300 yards (274 metres) wide and suitable for boat landing in reasonable weather. The Redoubt was built on the low western headland once Freshwater Cave had been built up to take the weight above it. A deep brick-lined ditch, crossed on the north side by a drawbridge, gave protection against land attack. An unusual two-storey residential caponier* at the north-west salient of the fort enfiladed* both ditches and the entrance with musketry fire. Reached by a vaulted stairway from the parade ground, the caponier housed 24 soldiers. Chalk from the ditch was thrown up to create a rampart* for riflemen. Beneath the western rampart were bomb-proof casemates for stores and ammunition. A one-storey building on the parade ground for officers and NCOs was converted in 1936 into a civilian two-storey house.

The guns were divided between two batteries separated by a chalk bank or traverse to minimise the effect of shells exploding. The seaward-facing Upper Battery mounted four 68-pounder SB guns on traversing platforms. In 1861 the two flank guns were replaced with Armstrong 7-inch RBL guns and the other two with 64-pounder RMLs in 1876. Originally firing through embrasures, these guns were blocked-up to fire over the parapet in 1888. A shell-filling laboratory was built behind the officers' quarters about 1861 and the magazine access passage extended south to it and a cartridge lift to the Upper Battery. The Lower Battery originally mounted three 8-inch SB howitzers to cover the beach.

Fears that an enemy ironclad could silence the fort then bombard the rear of the Needles defences led to a plan in 1889 for new replacements west of the Redoubt or for a high-angle battery hidden behind Tennyson Down. Nothing came of this except a modernisation of the Redoubt's armament: in 1891

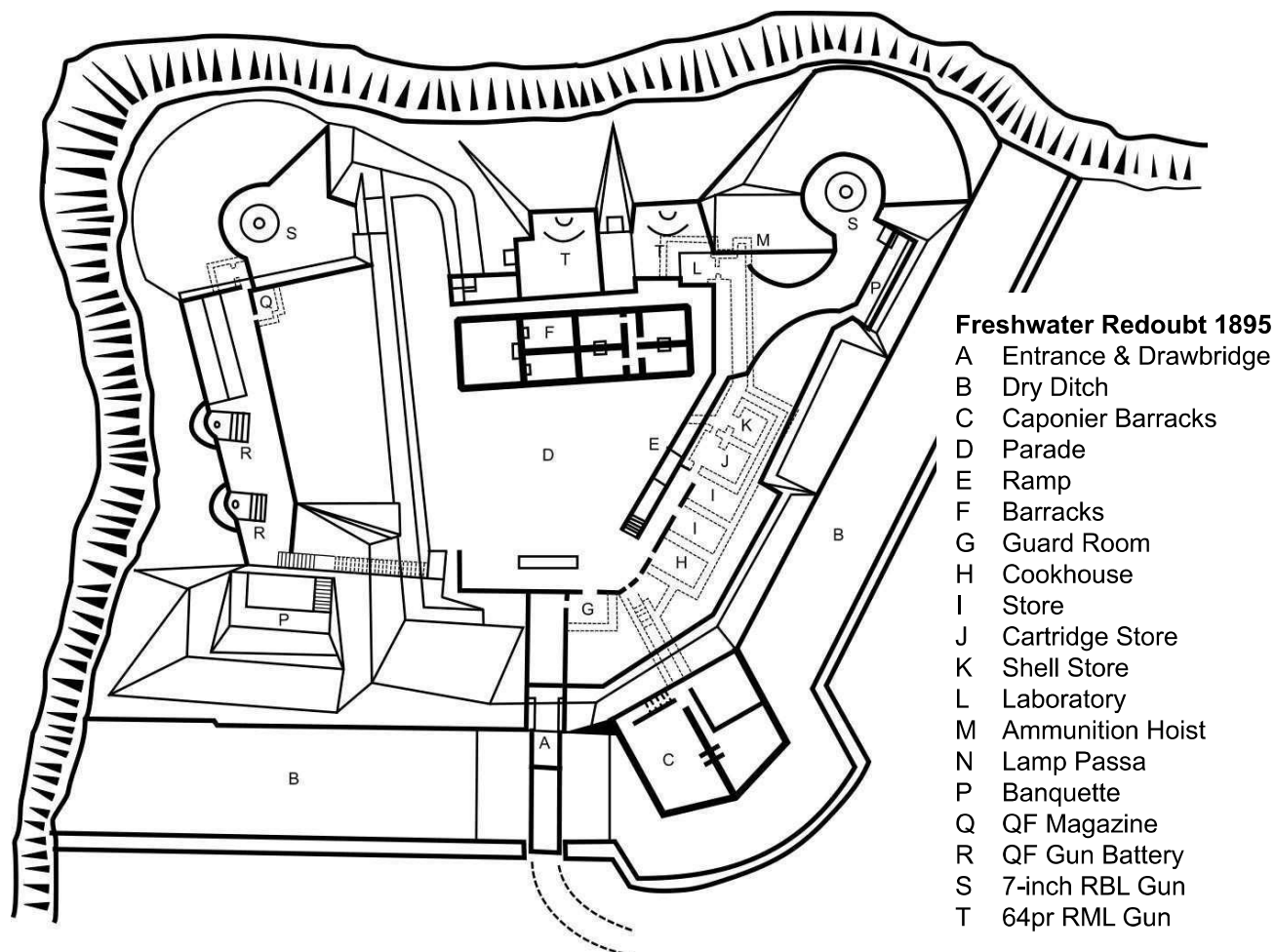
two 6-pounder Hotchkiss QF guns and a Maxim .45-inch machine gun (MG) replaced the howitzers in the Lower Battery. The Upper Battery 7-inch RBLs were removed in 1893, but a plan to install two 4.7-inch QF guns instead was abandoned in 1898.

The Upper Battery became an instruction battery for the Golden Hill school of gunnery in 1900, with two 12-pounder QF on the right and three 6-pounder QF on the left. On 25th July 1901, the right-hand 12-pounder's breech block blew out during practice, killing an officer and 3 gunners. In 1903, two 5-inch BL mobile howitzers were stored at the redoubt, to defend the nearby coastline. In 1907 the Upper Battery 6-pounders were removed: in 1908 the two 12-pounders went to Fort Albert. Only the Lower Battery was armed in the 1914-18 war against landing attempts.

The 6-pounders went in 1915, and were briefly replaced with two 12-pounder QF from Fort Albert. In 1916 two 15-pounder Ehrhardt field guns took their place. Ironically, these were German weapons bought for use by Britain in the Boer War, 1899-1902, which were now ready for use against German soldiers: they were removed in March 1918. After the war it was clear the Redoubt was too small for increasingly larger guns. It was sold off in 1928, guarded by sentries in the 1939-45 war and is today a private residence.

2. Old Needles Battery (Ordnance Survey ref: SZ 296 848)

This battery was originally proposed in 1855 for six 68-pounders to cover nearby Alum Bay against a French landing. The 1859 Royal Commission took up the idea and assigned the battery the additional task of covering the Needles Passage where it was squeezed to 2,000 yards (1,829 metres) width by the Shingles shoal. The work was built on the point, of the promontory, 250 feet (76 metres) above the sea. Four barbette emplacements faced north and two west. The battery was built between 1861 and 1863: in 1864 six Armstrong 7-inch BL guns were installed on traversing platforms. Though



underpowered, these could fire high explosive shells against a landing in Alum Bay and penetrate the wooden decks of passing ironclads.

The battery was defended by a dry ditch across the headland which was crossed by a rolling bridge. The shell and cartridge magazines were protected against falling shells under a chalk mound, surmounted by a terreplein* for musketry defence of the landward approach. A tunnel from the bridge pierced this mound, behind which was a guard room, shell-filling laboratory and the now-vanished officers quarters. Old Needles was ungarrisoned in peacetime: like many such batteries it was maintained by a warrant officer called a Master Gunner who lived beyond the ditch. The garrison gunners lived at Golden Hill Fort, but a two-storey barracks (now gone) on the parade ground could house 24 men in wartime. Beneath that was a 10,000 gallon water tank filled with filtered

rainwater. At the foot of the ramp to the terreplein and the two battery command posts was an artillery store (also demolished).

In the years 1869-73 the emplacements were enlarged to receive two 9-inch Mark I and four 7-inch RMLs but in 1873 six later-mark 9-inch RMLs were introduced (five Mark III, one Mark IV which had longer range). These were retained until 1903, by which time they were obsolete. The battery was too cramped to mount more powerful modern guns while their concussion might bring down the cliff. A new battery was therefore built higher up the headland in 1893-5 and Old Needles became a practice battery. In 1903 the guns were thrown over the cliff. The two now in the battery were recovered in 1983. However it did play other roles. About 1885 a sloping, brick-lined tunnel was dug from the parade ground to the downland west of the battery. Here a submarine mining cell was

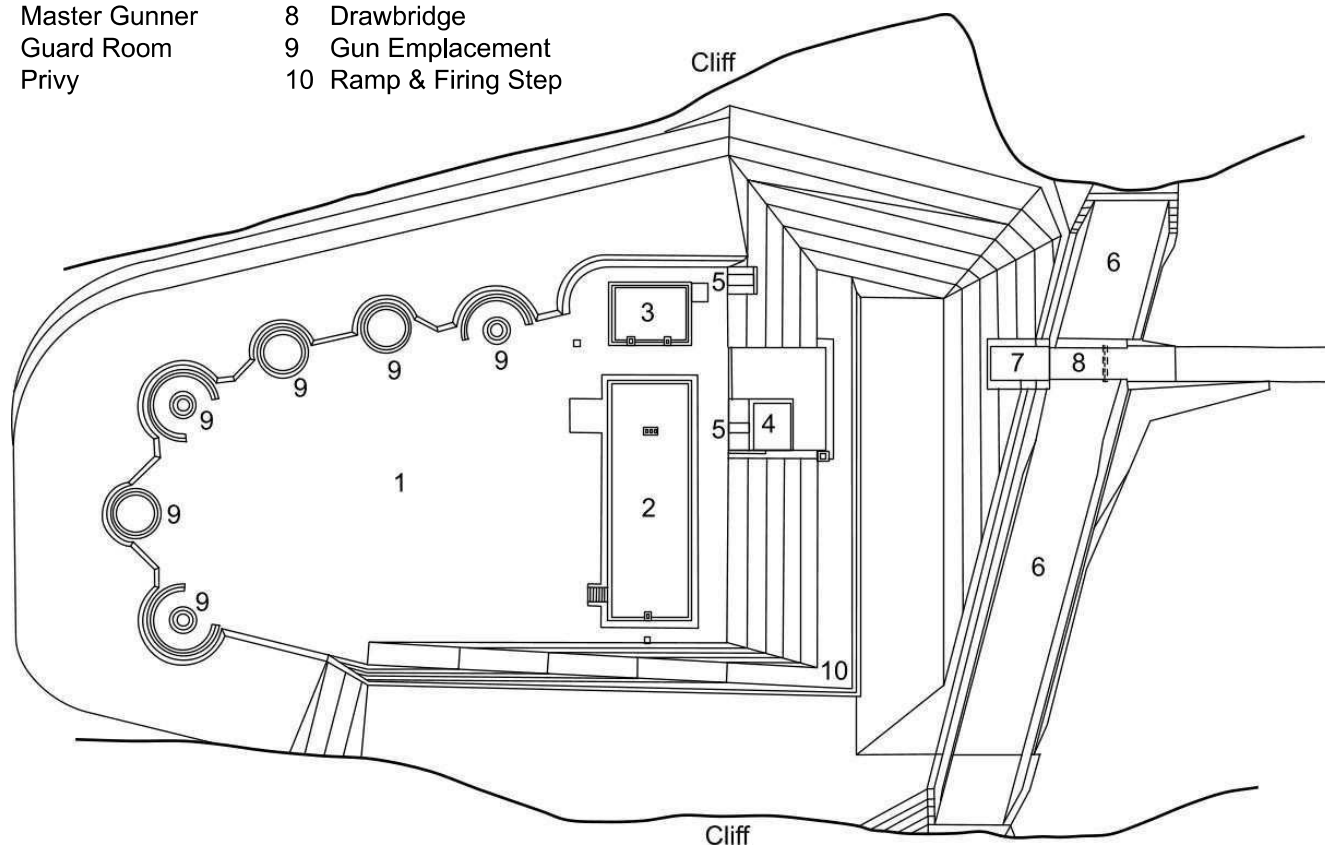
built for firing observation mines. By 1887 a lift shaft had been dug from the ditch down to sea level. A tunnel from the shaft bottom led to five emplacements in the north face of the cliff. The likely use was for quick-firing guns to combat torpedo boats. During the 1890-92 searchlight experiments a searchlight was experimentally installed in one emplacement and two 6-pounder QF guns were tried out in others in 1892. Visibility was too restricted for the guns (which were removed) but a sentry beam searchlight was installed in 1899 and used in World War I. In 1891-92 casemated engine and test rooms were built in the east wall of the ditch. A Robey engine (whose two boilers survive) was installed underground to power the lift shaft and searchlight via a dynamo. The test room was the firing point for electro-contact (EC) mines. The terrible heat underground (150°F in an hour) led to the building of a new engine room in the ditch about 1900, with a coal store above. In 1899 the western Submarine

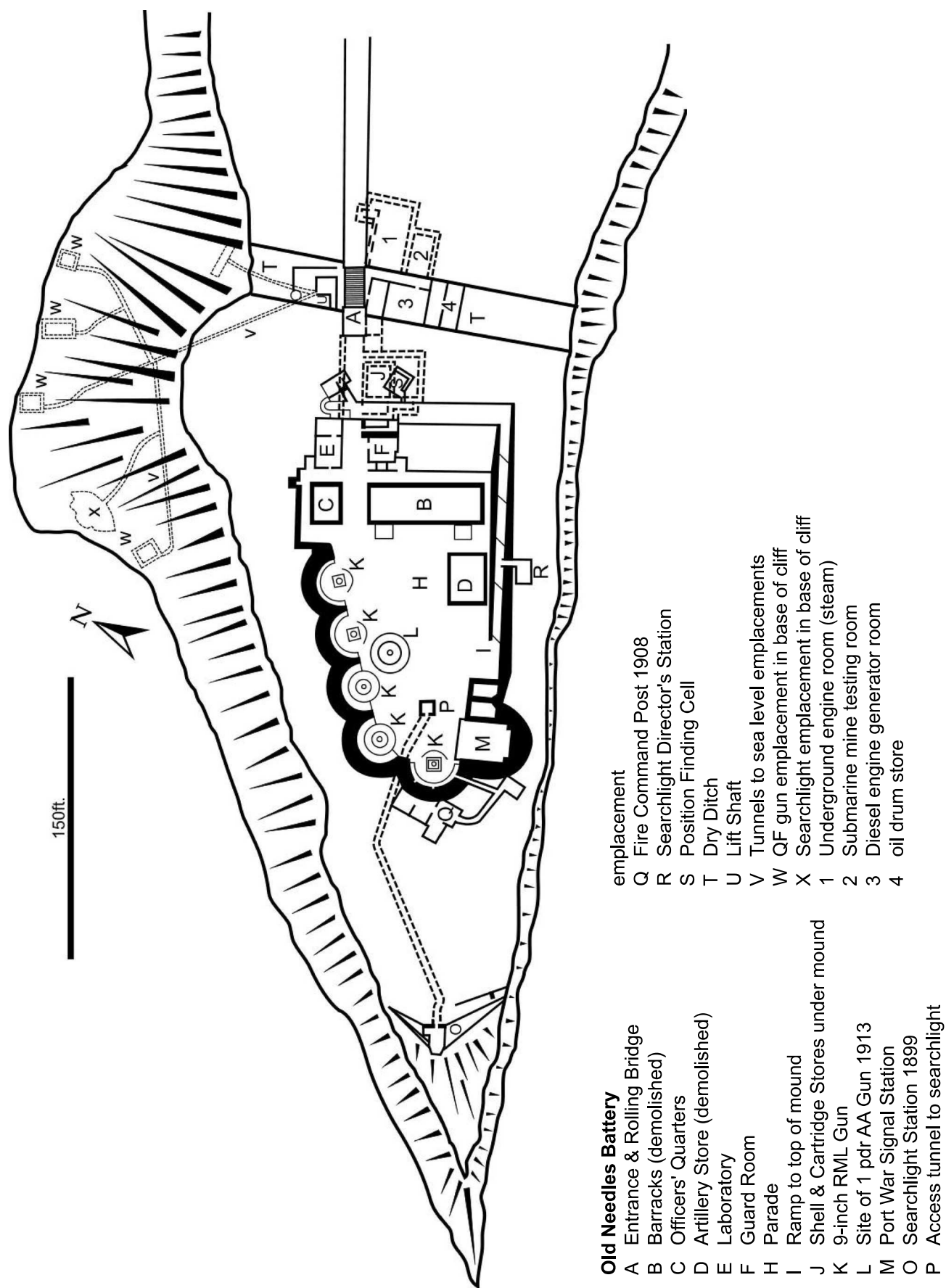
Mining cell was converted into a searchlight position but the light was too elevated above sea level to be effective. It had been removed by 1914. In 1915 a Campbell oil engine was installed in the lift house to power the lift, replacing the steam engines. A store for 600-gallon tanks of paraffin was built across the ditch.

Oddly, Old Needles was lit by lamps until 1941, when the engine room was reactivated. Two Lister diesel generators were installed to light both Needles batteries and another was added in 1943 to power a new sentry beam in a former sea level QF gun emplacement. A new electric lift gave access from 1944. A natural underground reservoir provided pumped water for both Needles batteries after 1887. In 1908 a fire command post was built west of the battery to direct all the Needles Passage guns. This was extended in both world wars, radar being added in 1944. One of the two attached PF cells is still intact. In 1940-41 a port war signal station* (PWSS) was built in a western gun emplacement.

Old Needles Battery 1860

- | | |
|-----------------|-----------------------|
| 1 Parade | 6 Ditch |
| 2 Barracks | 7 Entrance |
| 3 Master Gunner | 8 Drawbridge |
| 4 Guard Room | 9 Gun Emplacement |
| 5 Privy | 10 Ramp & Firing Step |





In 1913 Britain tested her first anti-aircraft (AA) gun on the parade ground. A 1-pounder pom-pom was mounted on a baseplate behind the northern RML emplacements and fired against kites towed by a destroyer. In 1939-41 a 3-inch AA gun was placed at the top of the ramp to engage German minelaying planes: in 1944 a more modern 40 mm Bofors AA gun took its place. At the north end of the terreplein stands a brick PF cell, one of two built about 1900 to direct the fire of New Needles Battery (its neighbour was demolished in 1919). Another cell, built in 1908 at the south end of the terreplein so New Needles could engage targets in the English Channel, was demolished in the 1960s after erosion of its supporting cliff.

Old Needles was mothballed in 1945, the radar removed in 1950 and the Fire Command abolished in 1953. In 1975 the National Trust bought the headland: after restoration, Old Needles was officially opened by HRH the Prince of Wales in 1982.

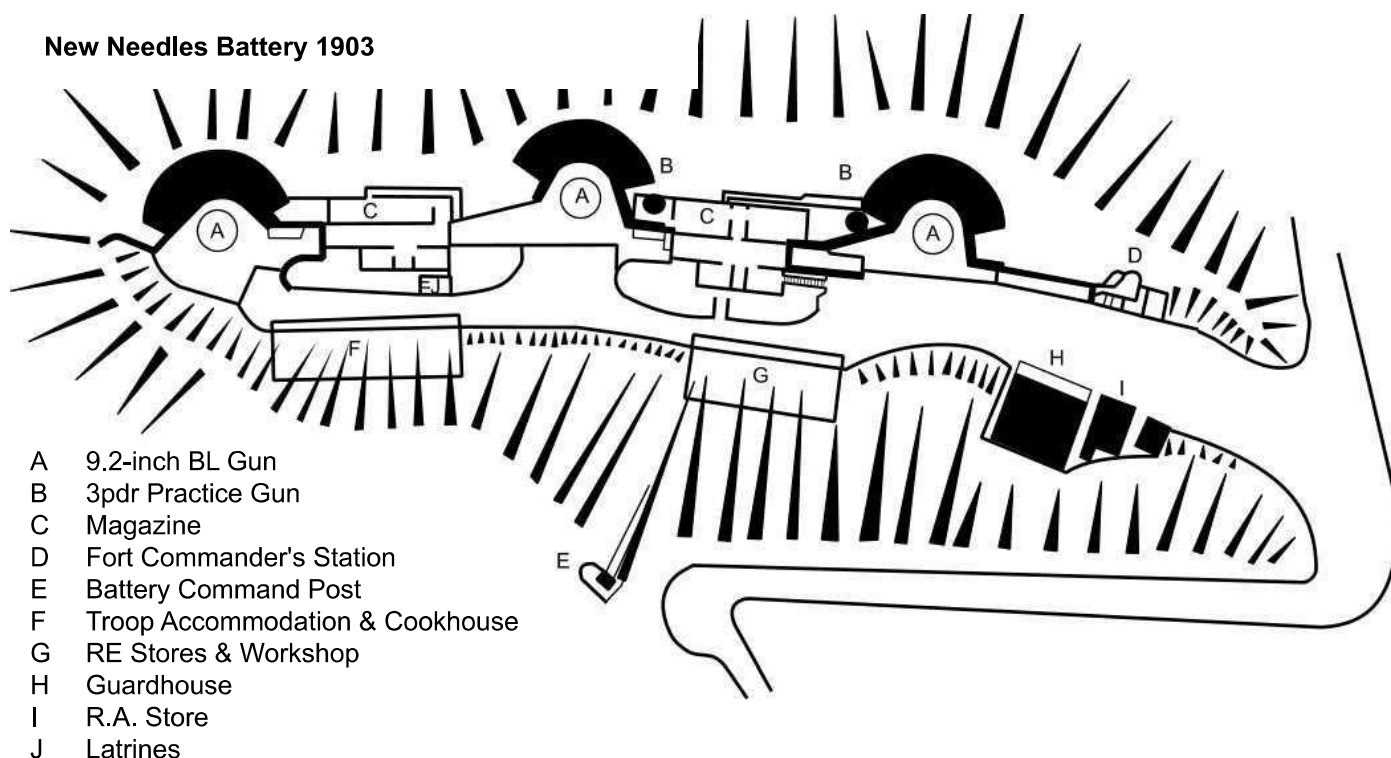
3. New Needles Battery (Ordnance Survey ref: SZ 300 848)

A new battery for three 9.2-inch BL guns was built in 1893-95 on high ground east of Old Needles. Built 390 feet (119 metres) above sea level, this barbette battery faced north-west. Behind the emplacements were a small number of administrative buildings but no barracks. Semi-underground magazines were situated between the emplacements: these were enlarged in 1900-1902. Two 9.2 inch Mark IX were emplaced in 1900 on Mark III mountings, and a third added in 1904. Two 3-pounder QF guns were installed between the centre and northern emplacements for practice firing but removed in 1907. Also in 1900-1902, a Battery Command Post* was constructed on the down above the battery and a cookhouse and shelter for 23 men built behind the southern emplacement. A PWSS and Coastguard cottages were built east of the battery, which was defended only by a steel palisade from land attack.

More alterations were carried out in 1911-14 to adapt the emplacements for Mark VB mountings. The original 9.2-inch guns were removed from the two flank emplacements in 1913 and replaced with new Mark IX barrels in September 1914, just after war began. They were landed at Colwell Bay and dragged by horse teams along the new road from Alum Bay which had been built in 1899. The centre barrel was not replaced and was scrapped in 1928. For war accommodation purposes old railway carriages and huts were built on the down. A 6-pounder Nordenfeldt QF was installed south of the left-hand emplacement to deter warships from enfilading the battery from the English Channel.

The BC post was given an armoured roof while three blockhouses* and a line of barbed wire across the headland gave landward defence. To prevent the 9.2-inch barrels wearing out in practice, sub-calibre* 6-pounder guns were superimposed on the flank guns in 1917. After only practice or bring to* firing in the war the guns were placed in care and maintenance in 1918, but were reactivated in 1926 for Territorial summer camps. The battery was manned again in 1939 in a counter-bombardment role, against blockships and their escorts attempting to close the Needles Channel. In late December the two remaining Mark IX guns were replaced by Mark Xs. Following fighter strafing attacks in 1940 steel air protection covers were added in 1941. Additional huts were erected for the gunners. In mid-1941 a Coast Defence Chain Home Low radar set was installed and manned by the RAF. A new gunners' shelter was built behind the centre emplacement in 1942 and two 40mm AA Bofors guns (one soon removed) installed in 1943.

In 1945 the battery was again mothballed and was listed for disposal in 1952. The guns were scrapped in 1954 but between 1956 and 1971 the site was used by Saunders-Roe Ltd for testing the engines of Black Knight and Black Arrow space rockets. The buildings, magazines and emplacements were adapted for control and storage and two test gantries erected south of the battery. The headland



was bought by the National Trust in 1975. They demolished most of the buildings in a bid to restore the downland to its pre-military state, leaving only the magazines and Battery Command Post.

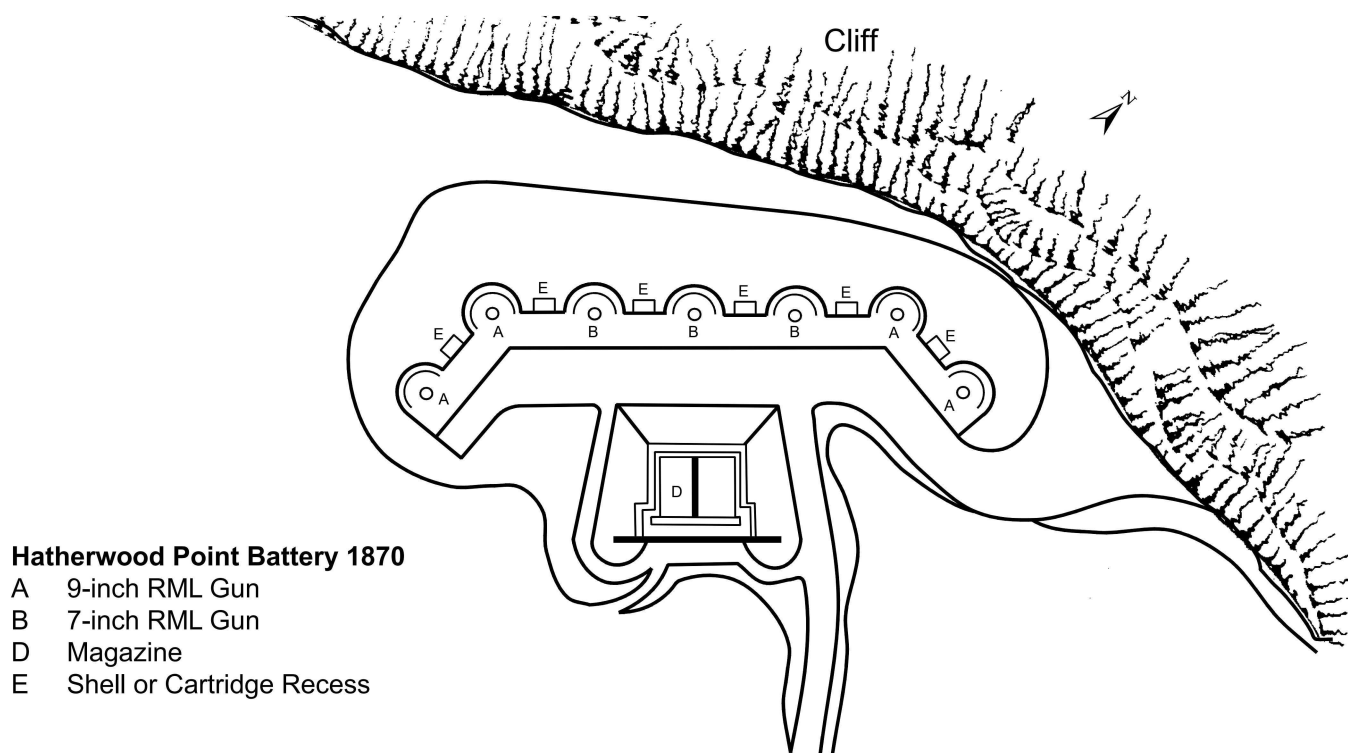
4. Hatherwood Battery (Ordnance Survey ref: SZ 308 857)

This battery, built 1865-69, was intended to cover both Alum Bay and the ship channel. Planned for six 68-pounder SB guns, it was completed with seven barbette positions. The first armament was actually three 7-inch RMLs in the centre, with two 9-inch RMLs on each flank. There were no landward defences: only the earth-covered magazine and some administrative buildings lay behind the emplacements. Situated in a remote spot at the top of a winding track, the battery was not permanently garrisoned.

About 1873 the three central emplacements were transformed into two for heavy 12.5-inch RMLs, whose expense* magazines separated the two guns. The main magazine had been relocated at 90 degrees to the left flank emplacements in a long mound which also contained a shell-filling

laboratory. In 1886 it was proposed to install a modern 10-inch BL gun in place of the two left hand 9-inch RMLs which were now inadequate but instead in 1888 these emplacements were converted to take 9-inch RMLs on long-range (35° elevation) mountings.

Around 1886 four position finding cells and a fire command station were built on Headon Warren to direct various batteries in the area. During the 1889-92 searchlight experiments all the guns defending the ship channel were controlled from here. In 1890 and 1891 a searchlight was temporarily installed in front of the battery, with a temporary engine room at the right rear. Soil erosion undermined the battery in the 1890s. An 1898 proposal for a new battery on the hill for two 9.2-inch BL and two 6-inch QF guns was rejected, so by 1900 the old work had been abandoned. Between 1940 and 1943 the site served as a Royal Navy indicator loop station. Erosion and demolition have left the battery today just a jumble of granite and concrete.

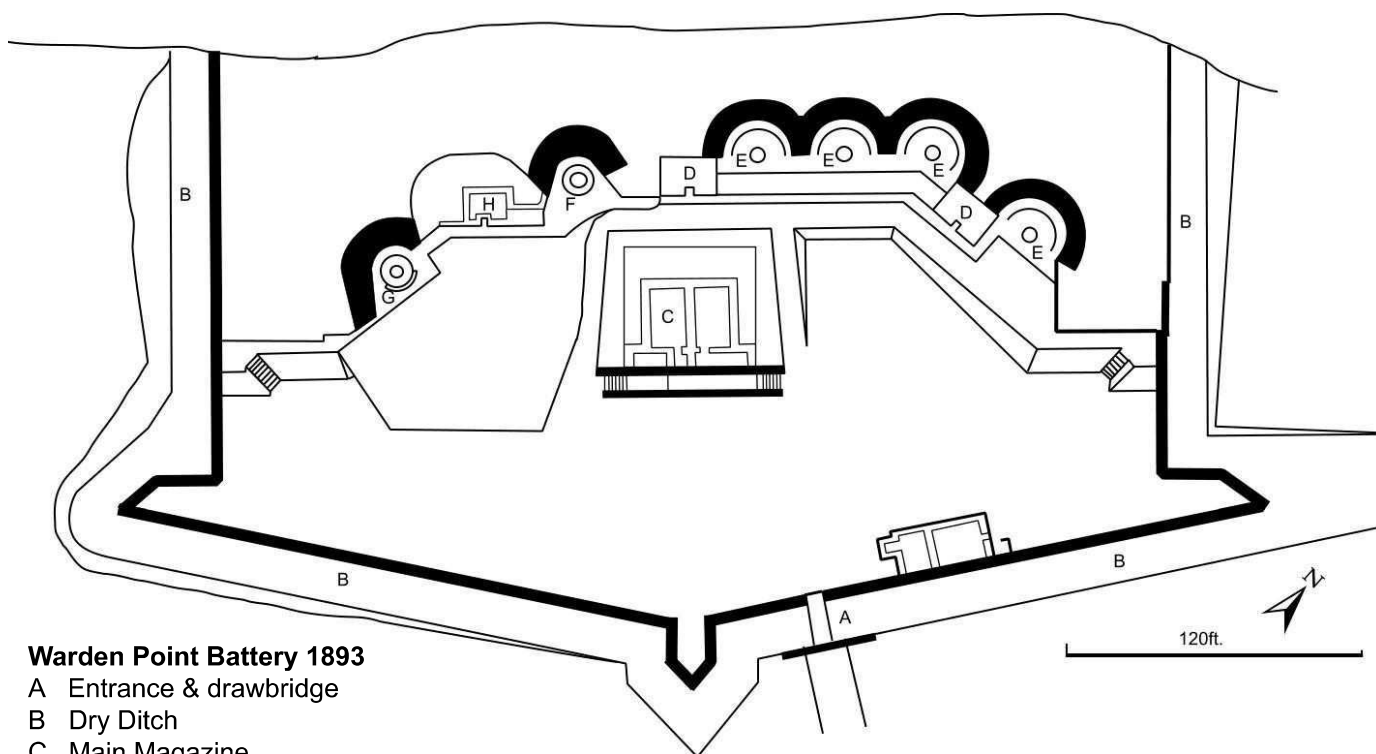


5. Warden Point Battery (Ordnance Survey ref: SZ 325 876)

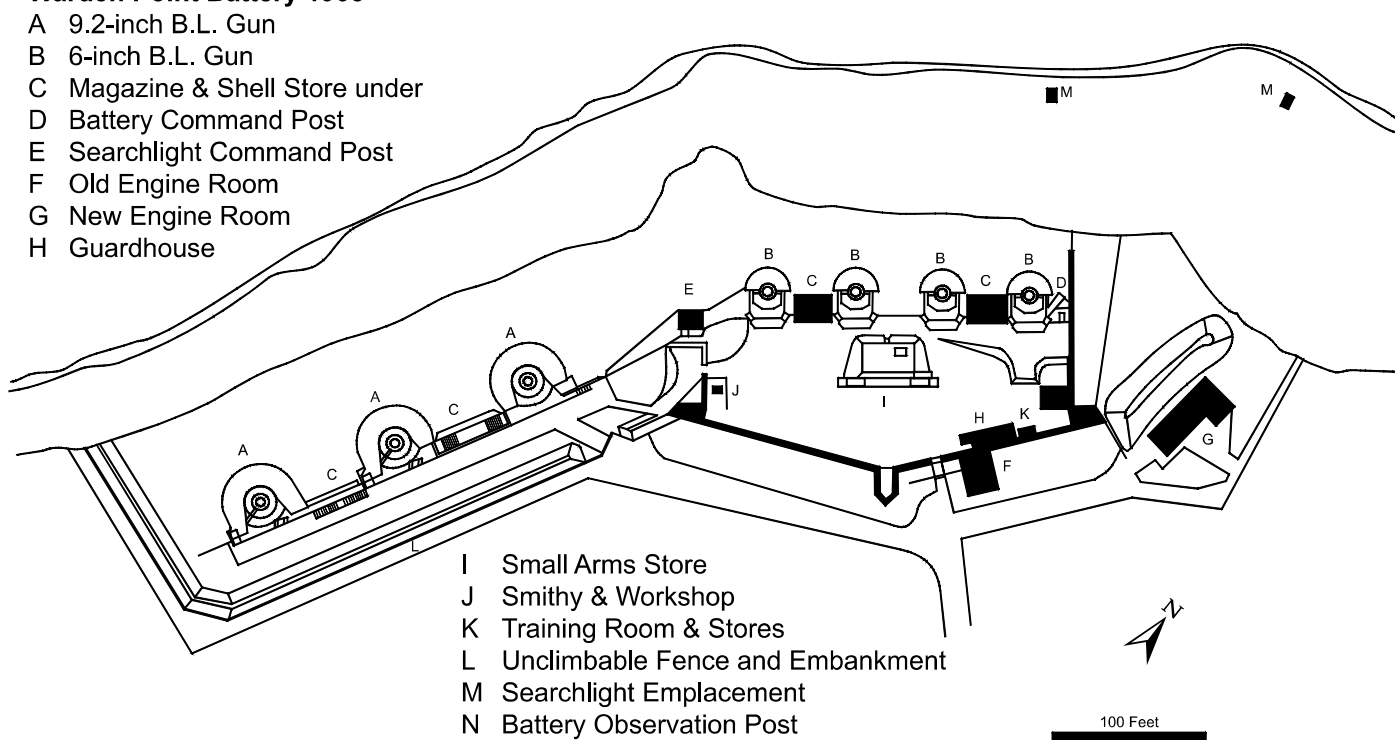
An eight-gun earthwork battery was proposed here in 1794 but not built. Certainly a two-gun one existed on the clifftop in 1803. The 1860 Royal Commission report proposed a six-gun barbette fortification on the point but the battery, as constructed in 1862-63, mounted eight guns in two groups of four. £6,000 of the £13,000 devoted to construction was spent on proper drainage of the 100 feet (30.5m)-high cliff and the building of a retaining sea wall at its base to prevent soil erosion. Initially four 7-inch RMLs and four 9-inch RMLs were installed, but in 1873 the intended complement of eight 9-inch RMLs was mounted. A large bombproofed magazine was in centre rear of the gun emplacements. The battery's landward side was protected by a loopholed brick wall with caponiers at the north east and south east corners, and a projecting one in the middle of the east wall which flanked the entrance just to its north. The battery was defended on three sides by a ditch. There was no barrack, the troops residing at Golden Hill in peacetime. Several proposals were made between 1880 and 1895 for rearming the work with heavier guns. In 1892-93 the four left-hand RML

emplacements were demolished and two new ones for long-range 9-inch RMLs built instead, with a two-storey concrete magazine between them. This stored shells at ground level and cartridges below that. The long-range RML idea was soon abandoned and in 1898 all the existing emplacements were demolished. Instead, four new emplacements for 6-inch BL Mark VII guns were constructed in two pairs in 1898-99. Simultaneously, emplacements for two 9.2-inch BL Mark X guns were built in 1898-1900 immediately south of the Victorian battery. While the work was under way, a third 9.2-inch emplacement and a second underground magazine were added in 1900. The 6-inch and 9.2-inch guns were installed in 1900-1 and 1902 respectively.

When the Owen Committee reported in 1905 that there were too many 6-inch BL guns along the Needles Channel, the four at Warden were relegated to reserve status in 1907 in favour of those at Cliff End. Searchlights were tried out on the sea wall below the battery during the 1889-92 experiments. In 1890 an experimental see-saw emplacement was built to the left of the battery but was not a success. In 1891 an engine room for two



Warden Point Battery 1903



Robey steam engines was built across a filled-in section of the ditch north of the gate. In 1898-9 a new underground engine room was constructed north of the original battery and protected by an unclimbable iron fence of the type which also enclosed the new 9.2-inch battery. These two years also witnessed the erection of two searchlight emplacements on the sea wall. In 1908 oil engines replaced the steam ones and in 1911 a concrete wall was built to protect the northern and southern extensions of the original battery from land attack. The blockhouses at the north end still survive.

In the 1914-1918 war the battery was surrounded with barbed wire and machine gun posts. The usual temporary huts were erected for the garrison's accommodation. The 6-inch guns were activated for war use but the two right-hand ones were removed in December 1914. The two 3-pounder practice guns from New Needles had been installed in 1907 in the 9.2-inch battery between the right and centre guns and these remained at Warden until 1918. Nevertheless, practice during the war was usually carried out on 6-pounder sub-calibre weapons superimposed on the 9.2-inch guns in 1910.

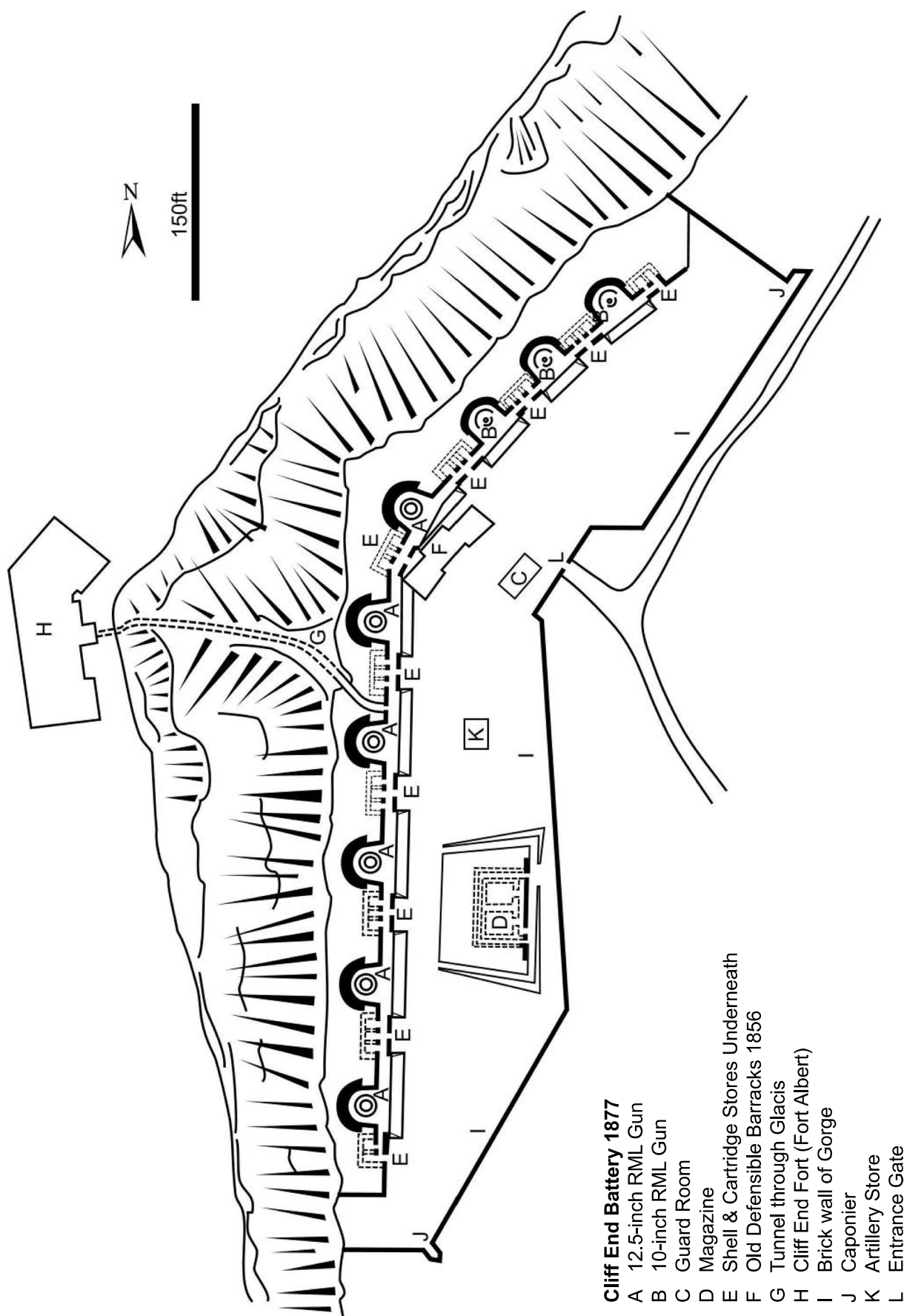
After the war the guns at Warden were used for Territorial summer camps, but subsidence was a serious and growing problem. The 6-inch emplacements had to be rebuilt in 1923-24. One of the 9.2-inch guns was removed in 1929, the other two and the two 6-inch in 1936. Subsidence was not the only reason: with 9.2-inch BL guns at New Needles and 6-inch BL at Cliff End, Warden was superfluous as a battery. In 1937, however, a Night Fire Command Post was built on the right hand former 6-inch emplacement. In 1939, searchlights were again installed in the old emplacements, powered by three 22kw Lister generators in the engine room. Light AA weapons were replaced in 1944 by a Bofors 40mm AA gun. Warden Point served throughout the war as HQ of 530 Coast Regiment and was retained for storage in 1945. Sold off in 1957 as a holiday camp, it has now been demolished to make way for a housing complex.

6. Cliff End Battery (Ordnance Survey ref: SZ 333 890)

Although a sixteen-gun battery was suggested in 1794, the first recorded work here was a three-gun earthen battery of 1798, thrown-up against the Napoleonic invasion threat. This earthwork soon decayed in peacetime. In 1854-56 a defensible guard house was built on the clifftop to protect Fort Albert below from musketry fire from the slopes. So indefensible was this building that a field work, enclosed by a ditch and surrounded by a palisade, was thrown up around it in 1858. This earthwork mounted eleven guns, three firing seawards, and had a brick caponier in the middle of the eastern ditch.

As the ship channel narrowed between Hurst Castle and Cliff End, the 1859 Royal Commission recommended a twenty-gun barbette battery along the crest at Cliff End. A major problem was the instability of the slopes when wet, and over £18,000 was spent on draining them and building a sea wall. This was still going on in 1870 and is the main reason why no guns were emplaced until 1877. Originally intended for 9-inch RMLs, the battery was actually armed with more powerful weapons (three 10-inch RMLs on the right and six 12.5-inch RMLs on the left) so the delay was probably beneficial. The bombproofed magazine lay centrally behind the 12.5-inch RMLs. The now useless guardhouse nevertheless survived until 1896 behind the 10-inch guns. A loopholed brick wall with caponiers at each end enclosed the battery, while a tunnel through the seaward rampart gave access to Fort Albert below.

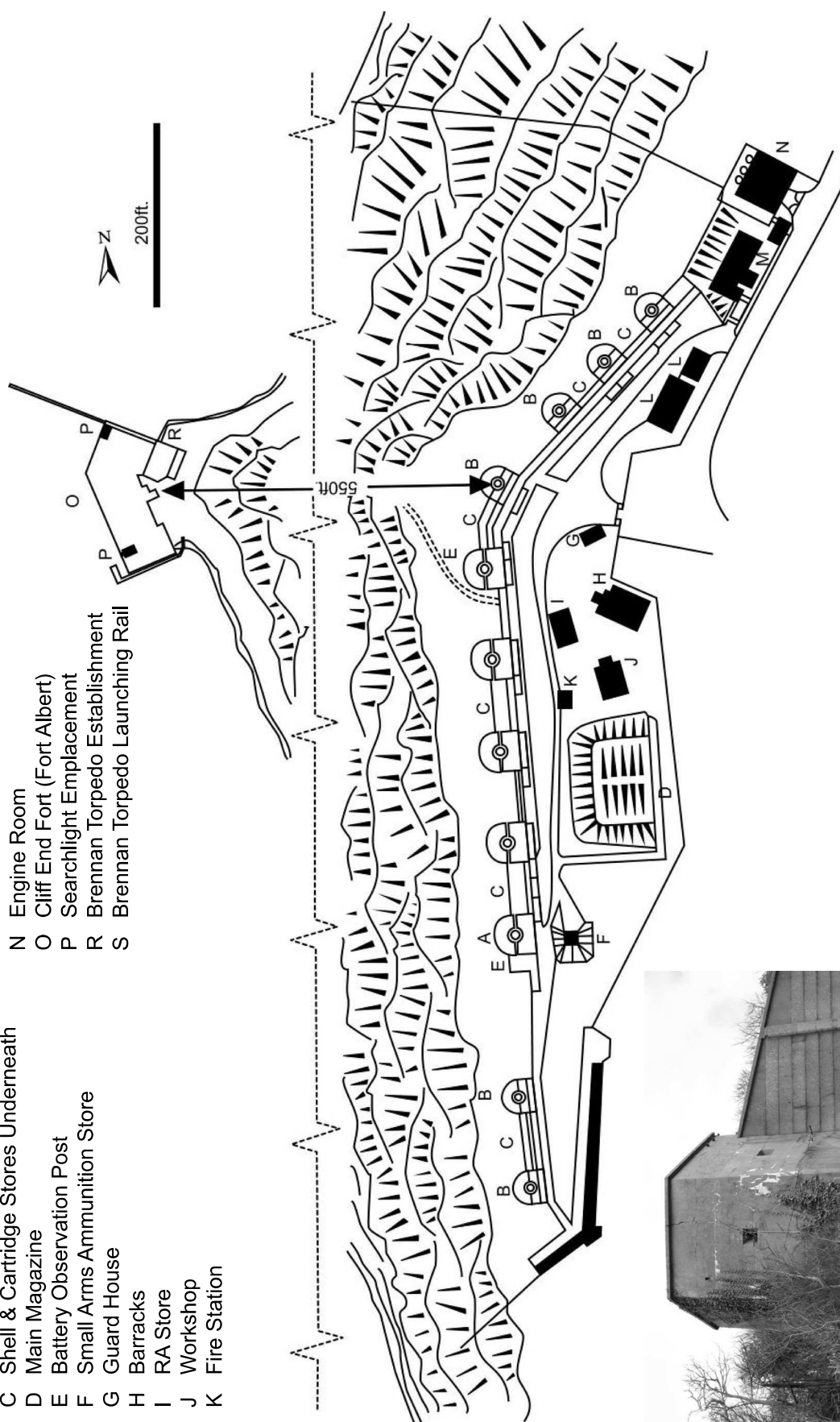
In 1886, bombproofed engine and submarine mining test rooms were built on the northern flank and five PF cells for plotting fire erected north of the battery. In the 1889-92 searchlight experiments, a fixed beam shone across the channel from east of the battery while a fighting light was placed on the sea wall where 6-pounder QF and machine guns were also positioned experimentally. In 1898-9 a searchlight emplacement was built each side of the battery.



Cliff End Battery 1903

- A 6-inch BL Gun
- B 4.7-inch QF Gun
- C Shell & Cartridge Stores Underneath
- D Main Magazine
- E Battery Observation Post
- F Small Arms Ammunition Store
- G Guard House
- H Barracks
- I RA Store
- J Workshop
- K Fire Station

- L Officers' Quarters
- M Oil Store
- N Engine Room
- O Cliff End Fort (Fort Albert)
- P Searchlight Emplacement
- R Brennan Torpedo Establishment
- S Brennan Torpedo Launching Rail



Concrete blockhouse at the end of the gorge wall

The outdated RMLs had too slow a rate of fire to cope with fast warships and were dismantled in 1899. In 1901 four 4.7-inch QF Mark III B were installed in new emplacements on the right of the battery to counter torpedo boats, and four 6-inch Mark VII on the left against cruisers. In 1903 two more 4.7-inch QF were mounted south of the 6-inch as the area Examination Battery. In 1903-4 a new engine room for three Hornsby oil engines was built north of the old one. It was extended in 1912 for a fourth engine, and a concrete wall with a hexagonal blockhouse at the north-west corner erected around the engine room area.

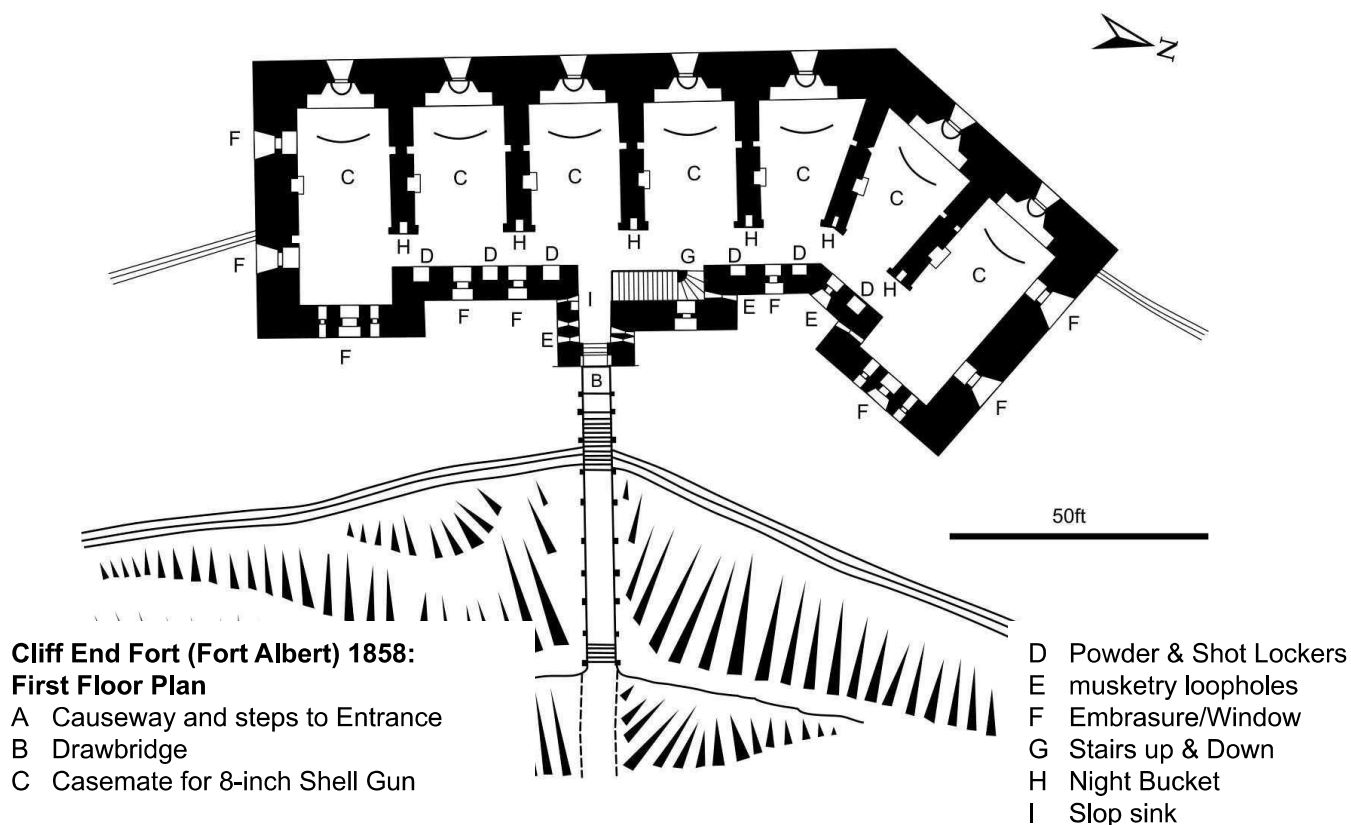
In the absence of a barracks, old railway carriages or wooden huts were erected in both world wars for the garrison. During 1916 two 6-inch guns were removed and in 1918 two 4.7-inch QFs were transferred to the Yorkshire coast and the two remaining 6-inch dismantled. Two replacement 6-inch barrels were mounted in 1924, but meanwhile two experimental Mark XXI 6-inch were emplaced for trials from 1918 to 1926. Two more 4.7-inch QF were dismantled in 1929, leaving only two 4.7-inch and two 6-inch Mark VII for the use of Territorial summer camps. The remaining 4.7-inch were removed in September 1939 at the outbreak of the next war. Overhead covers were built on the 6-inch emplacements in December 1940. An old 3-inch AA gun, installed in 1939, was replaced by the inevitable 40mm Bofors in January 1944. Two searchlights in the old sea-wall emplacements and three on Fort Albert were powered by four Ruston (later three Lister and one Ruston) diesel engines at Cliff End. After the war the two 6-inch went into care and maintenance until March 1951 when they were transferred to Bouldnor Battery. The searchlight equipment and engines were sold in January 1957 and the demilitarised site in due course was sold for a bungalow development. Much of the battery has since been demolished, leaving only the 4.7-inch emplacements, the Battery Observation Post of 1937 and the northern blockhouse standing in 1986.

7. Cliff End Fort (Fort Albert) (Ordnance Survey ref: SZ 330 890)

The original 1852 scheme to build a semi-circular fort for 41 guns on Warden Ledge was abandoned because of cost and unstable ground. The beach at Cliff End was chosen instead, but shortage both of money and of firm ground there resulted in a small brick fort mounting 29 guns in four tiers. To prevent enfilade by ships off Hurst Spit, the northern flank was refused* and embrasures cut in the flank wall. The magazines and stores were initially positioned in the basement, but they began to flood soon after the fort was built in 1854-56. Seven 68-pounder SBs were installed on the ground floor and seven 8-inch SB shell guns on both the first and second floor, all floors being casemated.* There were six 32-pounder SB guns on the roof, with an 8-inch SB howitzer at each end to cover the neighbouring beaches with shrapnel fire. A loopholed rooftop gallery on the landward side could cover the slopes behind with musketry fire. A wooden gangway from the shore led to a first floor entrance via a flight of steps.

Concern that the concussion of firing the 68-pounder would damage the walls led to their replacement with seven 7-inch RBLs in 1861. The 8-inch shell guns and 32-pounders were removed after 1872 and the 7-inch guns and 8-inch howitzers in 1887, when the fort was primarily an infantry barracks.

In 1886-88 the fort was converted into a Brennan torpedo launching station. The launching ramp, supported on piling, entered the sea next to the north end of the fort. It was covered by a timber lean-to-roof which initially contained the directing station. Behind this flank a two-storey torpedo storage room was built in concrete, with boiler and engine rooms beneath. The wire to drive the torpedo was wound onto a drum in a shed behind the torpedo store. Beneath the shed were fresh and salt water tanks. The northern two-thirds of the fort was filled to the roof with sea sand to protect the torpedo installation from naval gunfire. The remaining casemates were used for accommodation



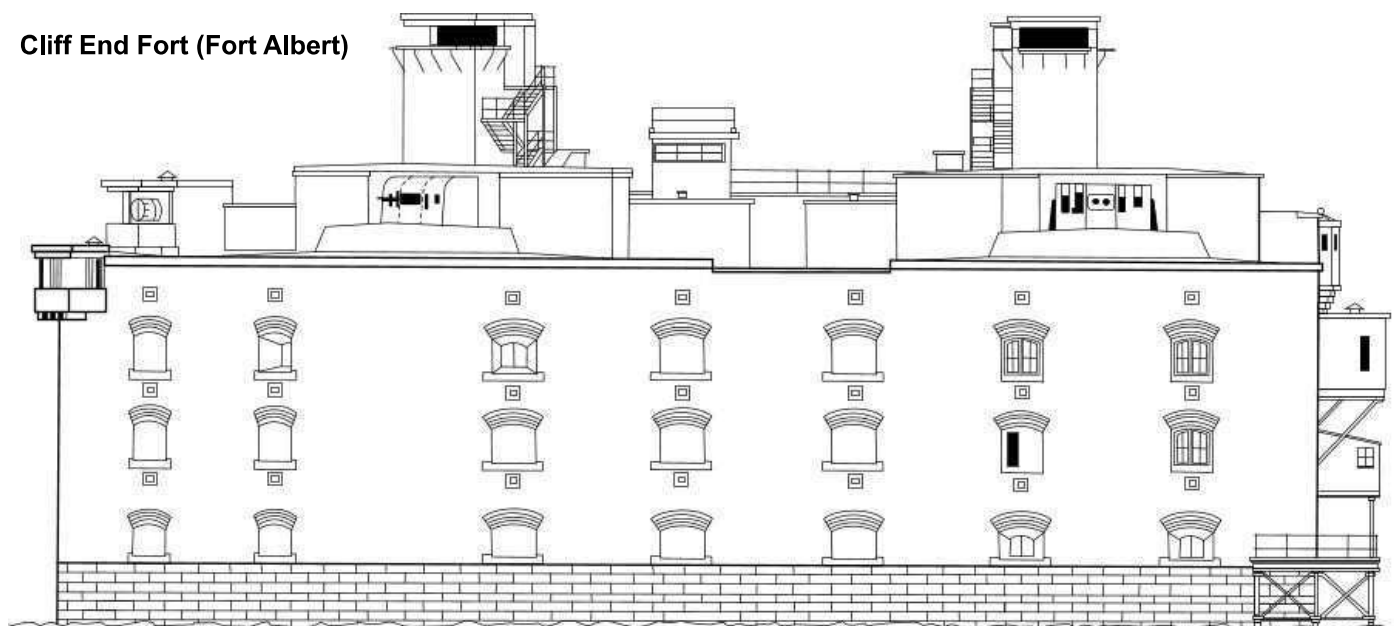
and stores. The flooded basement was filled with shingle. An old pier north of the fort was reconstructed for the landing of torpedoes.

Sometime between 1896 and 1903 alterations were made. A new engine room was built on the site of the wire winding room, which was reconstructed behind it (but demolished in 1935). A new boiler room was built on the south of the torpedo store. The original engine and boiler rooms were supposedly filled with shingle but this may not have been done. In 1903 the north pier was demolished and a new one built south of the fort. A plan to build a second launching ramp and engine room that year was abandoned as the weapon was too short in range for coast defence against modern battleships. Manufacture of the torpedo was closed down.

Being close to the narrows, Fort Albert was also used as a QF battery. Successively more powerful guns with more hitting power were installed: three 3-pounders between 1892 and 1896, then three 6-pounders from 1896 to 1902. In 1907 two

searchlight emplacements were built on the front right of the roof. In 1909 the fort replaced Freshwater Redoubt as a practice battery and received its two 12-pounders, two more being added next year. While all four were removed in 1915-16, the fort again had two rooftop 12-pounder QFs by 1925. These were dismantled in 1941. In February 1941 two twin 6-pounder equipments and director towers were built on the roof. The two filled casemates below the guns were cleared of sand and used as magazines. A new searchlight emplacement was built in 1942 on girders projecting from the south end of the top floor but it was unsatisfactory, so that the third projector* was located on the first floor in the second casemate from the south. Later in 1942, a Bofors 40mm AA gun was located on the hillside outside the fort. In 1947-48 the "twin-six" equipments were adapted to elevate to 80° as dual purpose coast/AA guns. Although the idea was abandoned in 1948, the guns and searchlights were not sold off until 1957. The fort is now a block of luxury flats, inaccessible to the public.

Cliff End Fort (Fort Albert)



8. Hurst Castle (Ordnance Survey ref: SZ 317 898)

The Tudor Fort of 1541-44 comprised a twelve sided keep* surrounded by an angled concentric curtain from which three semi-circular bastions projected equidistantly. The north-west one protected the gateway and was higher than the others as it covered the landward approach along the pebble spit; a drawbridge crossed the unrevetted moat and a portcullis protected the gate. As built, Hurst Castle had gun ports or embrasures* for 71 guns on six levels. The two-storey keep is 60 feet (18 metres) high, with an internal diameter of 45 feet (13.7 metres). Ammunition and food were stored in the basement and originally a circular central staircase (altered in 1888) connected both floors and the roof. Three short passages in the first storey walls gave access to the now vanished wooden bridges to the bastions.

Tudor economy and Stuart corruption meant the fort was usually short of serviceable cannon (there were only 11 in 1559, 24 in 1623 and 5 in 16281) and gunners. Although it was rendered obsolescent by the introduction of Italian arrowhead bastions, Hurst was always an important coastal fort and occasional state prison (Charles I was briefly held there in 1648). Charles II considered demolition, but 30 guns were mounted during the 3rd Dutch War (1672-74).

A 1779 survey listed fourteen 18-pounder and eight 6-pounder SB guns as mounted, but most had been badly corroded by rainwater and the bastion gun platforms had rotted. Urgent repairs were carried out in 1795 (during the Revolutionary and Napoleonic Wars with France, 1793-1815), and an external earthen battery built each side of the Tudor fort. In 1803-6 the Keep was vaulted in brick to bombproof* it and to support six 24-pounder SBs on traversing platforms on the roof. Eighteen 9-pounder SBs were mounted on the bastions and in their casemates in 1805.

No significant alterations were proposed until the invasion scares of the 1840s. In 1850 the fort mounted six 24-pounder SB and fourteen 18-pounder SB guns, but in 1852-56 major improvements were made. New artillery casemates were built behind the Tudor curtain walls which connected the bastions, considerably reducing the courtyard. By 1856 Hurst Castle mounted fifteen 8-inch SB shell guns, fourteen 32-pounder SBs and two 32-pounder carronades*. New external earthwork batteries were erected, with twelve 8-inch shell guns in the eastern one and seventeen in the western. A defensible barracks was built behind the western battery to defend the landward approach and three infantry caponiers built to flank the castle walls (one survives).

The 1859 Royal Commission considered the external batteries so low-lying that passing warships could sweep them with grape-shot*. Since enemy ships would pass Hurst rapidly on the fast current, the solution adopted was to overwhelm them with fire from guns protected within granite casemates to which wrought-iron front plates were later added. The external batteries were demolished and the Tudor fort retained as a keep and magazine: a one-storey wing faced with granite was built each side. The west battery comprised 37 casemates and the east 24. The rear of the batteries was protected by a massive wall.

Work began in 1861 and the superstructure was completed in 1870. Although £108,000 had originally been estimated as the cost, over £140,000 had been spent by 1886 on the superstructure alone. Eventually, nearly £80,000 had to be spent additionally to provide the wrought iron shields for the casemate fronts. Indeed, the wing batteries were not fully armed until 1879 because the development of thicker armour plate on battleships and of more powerful naval guns forced the designers to provide Hurst with bigger guns and increasingly thicker shields in 1873-79. Although the original plan called for the massive enough total of sixty-one 9-inch RMLs, an 1866 plan suggested six or eight two-gun turrets be added to the casemate roofs. This idea was reduced to four turrets, and then abandoned in 1868, probably because of cost and weight. A more exotic idea was then substituted to build rooftop emplacements for four 9-inch RMLs on Moncrieff counterbalanced disappearing carriages, whereby the guns sank into a pit on firing to be reloaded in safety. Again economy prevailed in 1870, and the idea was abandoned: today the only signs of these abortive intentions are the shafts for ammunition hoists in several casemates.

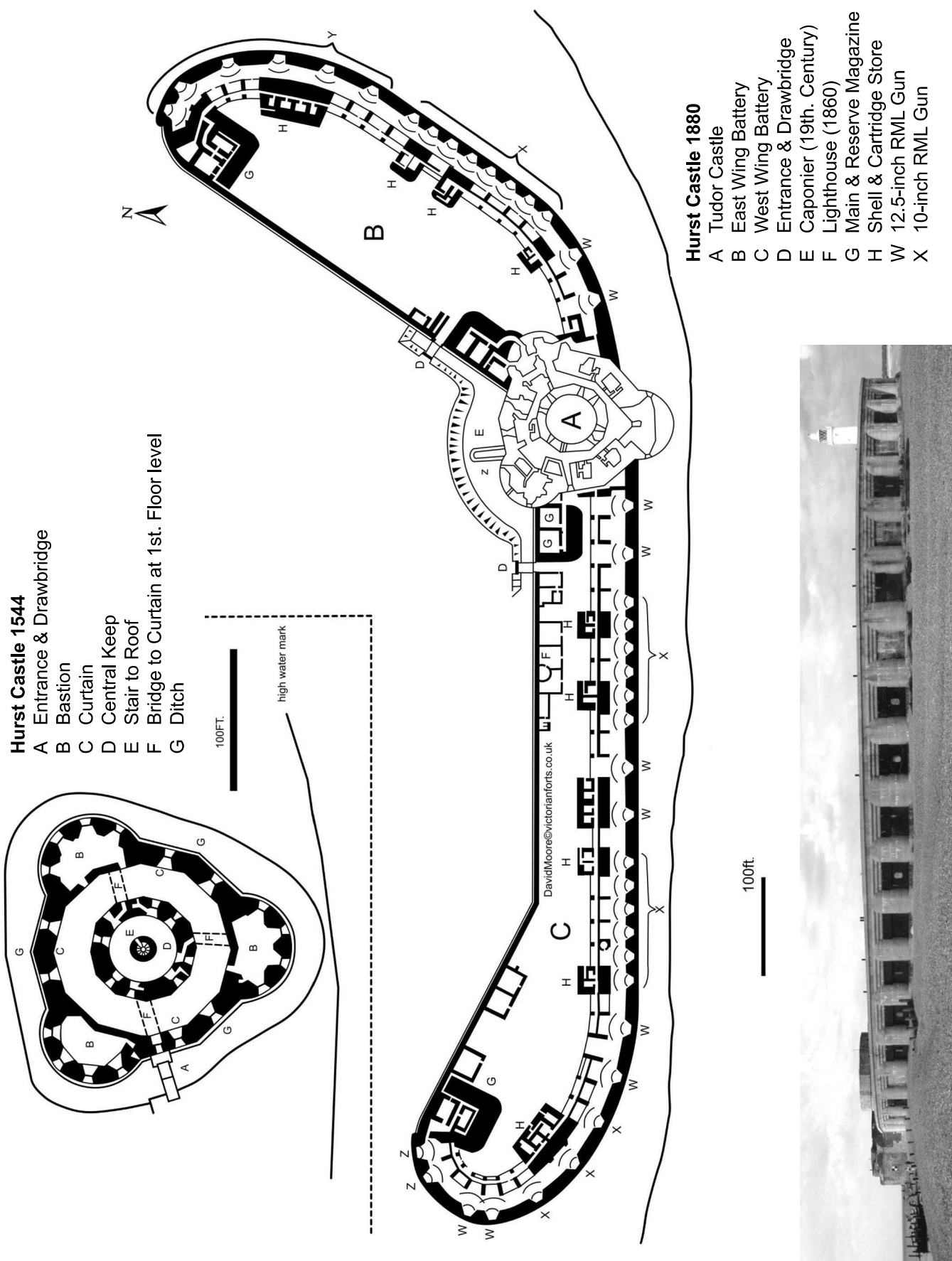
Construction of the east wing battery masked the Tudor north east bastion, through which an entrance was made: the basement became a shell store. Although the Keep basement formed the main magazine, it was badly ventilated and damp initially. Two large magazines in the rear of each

wing battery supplied seven expense magazines and seven shell stores situated behind the casemates. An early idea was for the shell stores to be on the roof of each wing, serving the guns below, but the weight would have been too great.

The original armament specification was for sixty-one 9-inch RMLs, but only twenty had been installed in 1873 when it was decided to mount more powerful guns. After six years had been spent in making and fitting thicker armour plate, a mixture of the more penetrating 12.5-inch and 10-inch RMLs was fitted in 1879. In fact, twenty casemates had been built with solid granite fronts from the beginning, while fifteen of the 9-inch RMLs were removed, the remaining five being left in the east wing. Eight 12.5-inch and fifteen 10-inch RMLs were emplaced in the west wing, with two 12.5s and eight 10-inch going into the east wing. Three smaller 64-pounder RMLs were installed in the Tudor south bastion; two in the north part of the old castle covered the rear of the fort; while one in the west wing extremity and one in the east covered the adjacent shingle.

Fears that shells would penetrate the casemate fronts and explode in the expense magazines led in 1889 to a major improvement in protection. Part of each flank magazine in the wing batteries was filled in with concrete to prevent enfilade fire penetrating: new entrances were cut into these and the large magazine north east of the Tudor Castle. Nine casemates were filled with concrete and the western expense magazines rebuilt so that shells were stored at ground level and cartridges below. Meanwhile, to protect the main magazine in the Keep basement, four feet (1.2 metres) of concrete was applied to the courtyard in 1888-89 and a new ammunition hoist built. The south bastion was filled with concrete to resist shellfire.

After 1886 the RML guns were increasingly obsolete and many were removed. The casemates were too small for the new breechloading heavy guns which were more suited to the barbette batteries on the Isle of Wight. After 1894 there



were only ten 12.5-inch, fifteen 10-inch, five 9-inch and three 64-pounder RML guns. Instead, three 6-pounder QF guns were mounted east of the fort after 1893. To provide illumination, in 1898-9 a searchlight emplacement was built on the pier east of the fort and another on top of the west wing. A 12-pounder QF was emplaced either side of the latter in 1902, with another such weapon on the keep. The western light obstructed the 12-pounders, however, and was removed by 1908. In 1914 two new searchlight emplacements were built in front of the west wing, each of two storeys and entered through the adjacent casemate. The original engine room was behind the west wing flank.

During the 1914-18 war, seventeen RMLs were retained in the casemates and loaded with case shot* against torpedo boats. They would have been fired electrically from the roof at close range like giant shotguns. These RMLs and the 6-pounder QF were removed in 1918, the 12-pounder QF and the searchlights in 1928, and the fort was demilitarised until 1939 and another world war. In June 1940 two 12-pounder QF guns were installed in their old emplacements against torpedo craft. Two searchlights in the old emplacements were joined by lights in four new positions: two in casemates, one in a new western external emplacement and one on the south bastion. Two western casemates acted as engine rooms.

In 1941, two twin 6-pounder equipments were mounted on the western wing. In 1943 a 40mm Bofors AA gun was emplaced on the east wing roof, with another west of the 12-pounders in 1944. The AA guns were removed in 1945, the 12-pounders in 1948 and the twin-sixes and searchlights in 1957 after twelve years in maintained readiness.

The Tudor Castle and some western casemates are open to the public, while English Heritage are gradually restoring the rest of the Victorian fort.

9. Fort Victoria (Ordnance Survey ref: SZ 339 898)

The invasion scares of the 1840s led to this brick fort which covered the deep-water channel near Sconce Point. The original design suggested two casemated batteries meeting at an obtuse angle, the flanks terminating in square towers. A diamond shaped plan was completed by a loopholed rear wall, but the design was amended to save money. Instead, a triangular fort was built in 1852-55, with the apex towards the sea. The two seaward batteries met at a right-angle, the flanks refused to avoid enfilade fire in a style resembling Russian forts of the 1830s. The semi-circular upper part of each casemate face was open, so that shells could pass through rather than explode among the gunners. To prevent damage to the fort interior, however, a broad earth bank or *parados** 13 feet (4 metres) high stood behind the casemates to absorb shells. The seaward front of each battery was protected by an earthen *glacis** which sloped down to a stone-lined wet ditch intended to hinder assaulting infantry. The western battery housed ten 68-pounder SB guns and eleven 10-inch SB shell guns armed the northern one.

The rear of the fort comprised two barracks, each of two storeys, joined by an arched wall which was loopholed for muskets. The two flank towers were omitted from the eventual design. Six 32-pounder SB guns mounted on wooden traversing platforms* on the roof of each barrack could fire seaward over the top of the one-storey water-level batteries. Additional embrasures were provided for extra guns on the first floor, again firing seawards, but none was ever installed. The gate in the centre of the rear wall was defended by a *portcullis** whose descent automatically raised a drawbridge. The main magazine and shell store were on the ground floor of the western barrack, while expense magazines were recessed into the rear side of the parade ground traverse.

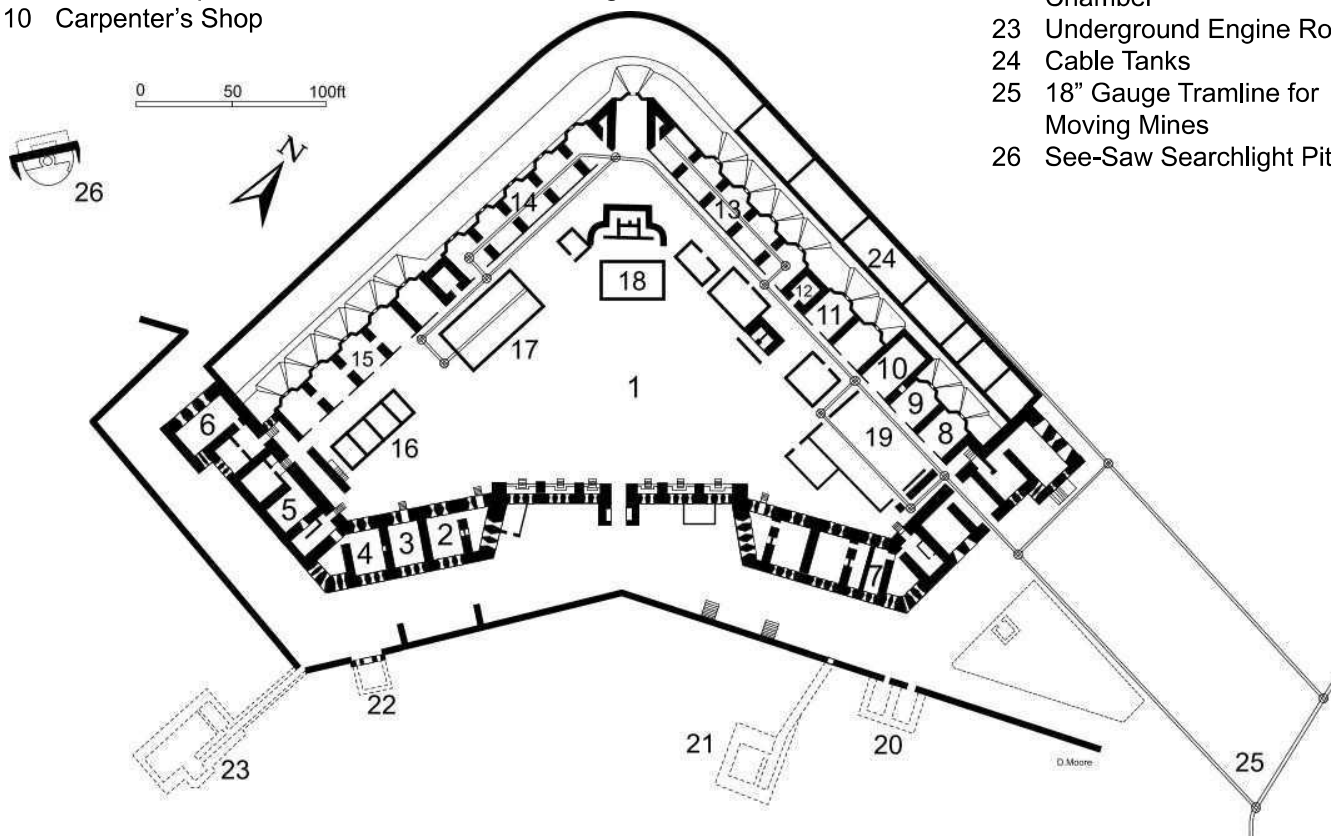
Rifled artillery soon made both Forts Victoria and Albert obsolescent, despite the installation of three 7-inch Armstrong RBLs in the salient casemates in

Fort Victoria 1897: Converted to Submarine Mining Depot

- 1 Parade
- 2 Army Service Corp Store
- 3 Cook House
- 4 Reading Room
- 5 Magazine
- 6 Electric Light Store
- 7 Canteen
- 8 Instrument Repairer's Shop
- 9 Smith's Shop
- 10 Carpenter's Shop

- 11 Chain Store
- 12 Firing Apparatus Primer Store
- 13 Old Gun Casemate converted to Empty Mine Case Store for Electro-Contact Mines
- 14 Old Gun Casemates converted to Loaded mine Store for Electro-Contact Mines
- 15 Electric Light Store

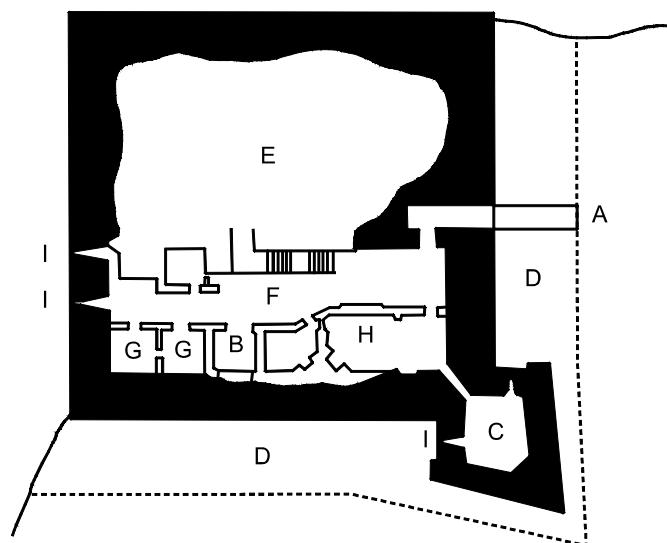
- 16 Stores and Offices
- 17 New Loaded Mine Store for Electro-Contact Mines
- 18 Royal Engineers Store
- 19 Empty Mine Case Store for Ground mines
- 20 Coal Store
- 21 Underground Submarine Mining Test Room
- 22 Underground Accumulator Chamber
- 23 Underground Engine Room
- 24 Cable Tanks
- 25 18" Gauge Tramline for Moving Mines
- 26 See-Saw Searchlight Pit



1861. Fort Victoria was increasingly used as an infantry barracks and in 1876 it was disarmed, leaving a saluting battery of eleven 24-pounder SB guns east of the fort which was removed in 1891. In the latter year the Royal Engineers took over the fort and converted it into a submarine mining depot. The casemates were boarded up and used for storing sea mines. The parade ground traverse was removed in 1896 and replaced by offices. An 18-inch (.5 metres) gauge tramway was laid to the pier for trucks carrying the loaded mines. The north ditch was filled with cable tanks and a test room for detonating mines was built in the hillside.

An experimental see-saw searchlight pit was built west of the fort in 1888, with an underground engine room in the hillside behind to provide power. In 1898-99, three one-storey concrete searchlight emplacements were erected, one west and two east of the fort, to illuminate the adjacent minefield.

In April 1908 the cruiser *Gladiator* was rammed in the Solent by the US liner "St Paul" during a snowstorm. The wreck was beached east of the fort and the Royal Engineers helped to rescue most of the crew: nevertheless, 27 men died. The fort was given up by the Royal Engineers in 1920 and

**Yarmouth Castle c1700**

- A Original casemates
- B Present entrance
- C Bastion
- D Site of ditch
- E Infill of platform 1561-65
- F Courtyard
- G Magazines
- H Living Quarters
- I Original embrasures

10. Yarmouth Castle (Ordnance Survey ref: SZ 355 898)

This stone fort of 1547 guarded both the harbour and the northern entrance to the Freshwater Isle, as well as assisting Hurst Castle to cover the ship channel. If the rest of the Isle of Wight fell to invaders, reinforcements could be sent via Hurst if the Freshwater Peninsula were held.

The fort was square, with the sea on the north and west sides and a ditch 30 feet (9m) wide on the other two. The original eastern entrance was blocked up in the late 17th century and a new one cut through the south wall. Initially the fort's interior was composed of ranges of buildings 28 feet (8.5 metres) high, surrounding a small central courtyard. These mounted cannon on the roof, with hand-gun ports on the ground and first floors. A survey in 1559 led to the demolition of the internal ranges and a reduction in height of the outer walls by nine feet (2.74 metres). The resulting rubble was used in 1561-65 to build a platform for artillery in the seaward half of the square. The height of the platform was raised in 1609 when external buttresses were added.

Yarmouth Castle is notable for its arrow-headed bastion whose long sides tapered to a point to deflect cannon shot. The arrow head protected gunports recessed into the flanks which connected the bastion to the fort walls. These gunports or 'flankers' covered the ditch in both directions, with hand-guns on the first two floors and cannon on the roof. Yet both the bastion and the original walls were too high and too vulnerable to artillery fire. The effectiveness of the bastion was diminished

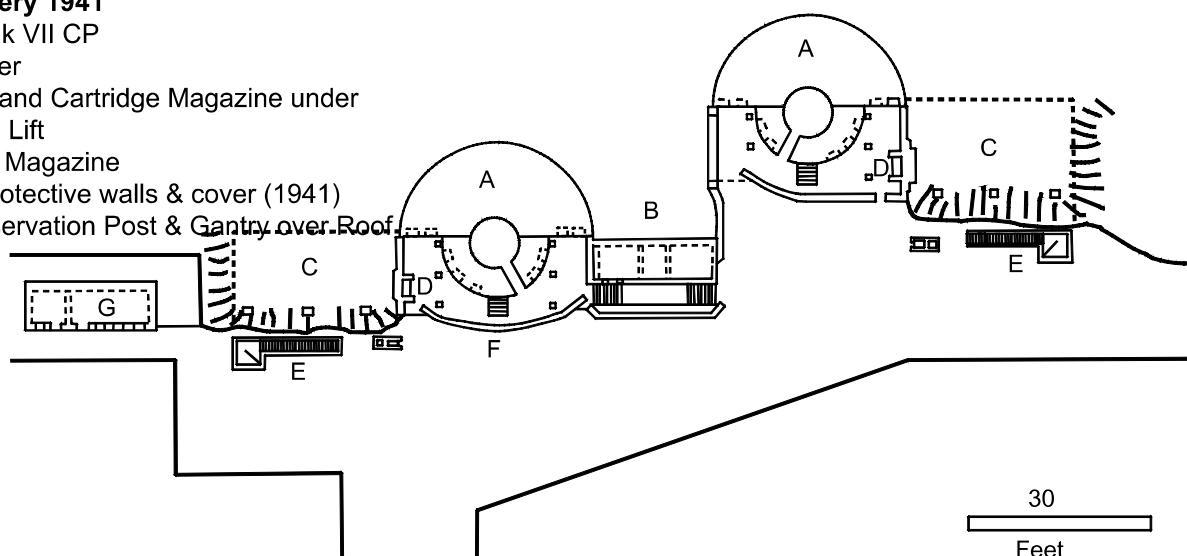
placed in care and maintenance until 1939, being used to store towed targets for the nearby coast batteries to shoot at. During 1941-43 the fort and the nearby holiday camps were the home of the 72nd Coast Training Regiment, Royal Artillery, which was preparing drafts of gunners to man 6-inch batteries. This was followed by the 129th Light AA Regiment, RA, whose 40mm Bofors AA guns were placed on barges which were towed to Normandy in June 1944 to protect the British 'Mulberry' artificial harbour.

Also at Fort Victoria from May 1944 for the Normandy invasion was the HQ of the No. 42 Water Transport Unit, Royal Army Service Corps. Its launches operated off the Normandy beaches. From 1946-62 the Water Transport Training Company, RASC, used both Forts Victoria and Golden Hill for accommodation for National Servicemen who learned to handle launches and landing craft.

Marine engines were housed in the casemates for instruction purposes. The Army gave up the fort intact in 1962, but the barrack blocks were demolished in 1969. The casemates still survive, although many have been converted: there is a small museum.

Bouldnor Battery 1941

- A 6-inch BL Mk VII CP
- B Troop Shelter
- C Shell Store and Cartridge Magazine under
- D Ammunition Lift
- E Entrance to Magazine
- F Concrete protective walls & cover (1941)
- G Battery Observation Post & Gantry over Roof



further in 1565 when it was given a pitched roof. Shortly before this a house had been built in the south east corner of the fort for the captain of the garrison.

In 1547 the fort mounted sixteen guns but peacetime decay in the following century often reduced the number to only five. Nevertheless in 1597-8 an earthen battery was built beyond the eastern moat. In 1632 a new, earth parapet was raised around the platform, while cramped rooms for gunners were built in the south east part of the fort, with a long store room on the second floor above.

The fort was strongly held under the Commonwealth but the garrison was greatly reduced under Charles II. Sometime between 1669 and 1692 the moat was filled in, a new entrance made, the eastern earthworks demolished and a new battery built on the quay south-west of the fort. In 1760 Yarmouth Castle mounted eight six-pounder SB guns on the platform, with five 9-pounder SBs in the Quay Battery. In 1813 racers for four naval guns (8-pounder SBs) on traversing platforms were laid. New guns were substituted in 1885 during the Crimean War, by which time the fort was too small and defenceless to be of much use. Disarmed in 1885, it served as a Coastguard signal station until 1901. Today it is opened to the public by English Heritage.

11. Bouldnor Battery (Ordnance Survey ref: SZ 379 902)

This battery for two 6-inch Mark VII BL guns was built in 1937-8 to cover a new Examination Anchorage east of Yarmouth. Two searchlight positions were constructed in front of the battery, with a permanent engine room for three Crossley oil engines in the right near of the battery. A battery observation post (BOP) containing a rangefinder stood to the west of the guns. A concrete shelter for gunners was sunk into the ground between the emplacements whose magazines were underground on the flanks of the gun positions. In the winter of 1939-40 a large number of huts were built behind them to accommodate the garrison.

In December 1939 an indicator loop was laid across the channel east of the battery. An anti-submarine boom and a controlled minefield were laid in mid-1940 at Hamstead Point, east of Bouldnor. All were supervised by the Royal Navy. During 1940 rough concrete air defence covers were erected over the guns. In July 1941 the two Mark VII guns were replaced with relined barrels. The battery was built on blue slipper clay, however, and the searchlight emplacements began to slide into the sea. As a result the battery ceased to operate in December 1942, although a 40mm Bofors AA gun was added in January 1944. At the end of the war this was removed and all other equipment placed in care and maintenance in October 1945.

Although the guns and searchlights were removed in 1947, the battery was reactivated in September 1951. Two 6-inch Mark VII from Cliff End were installed. The eastern searchlight was housed in a new wooden emplacement and the western one rebuilt virtually on its old site. Three 22Kw and one 12Kw Lister diesels were installed in the engine room. Gun practices were carried out until November 1955: as the electric ammunition hoists had been removed in 1948 hand-operated hoists had to be used.

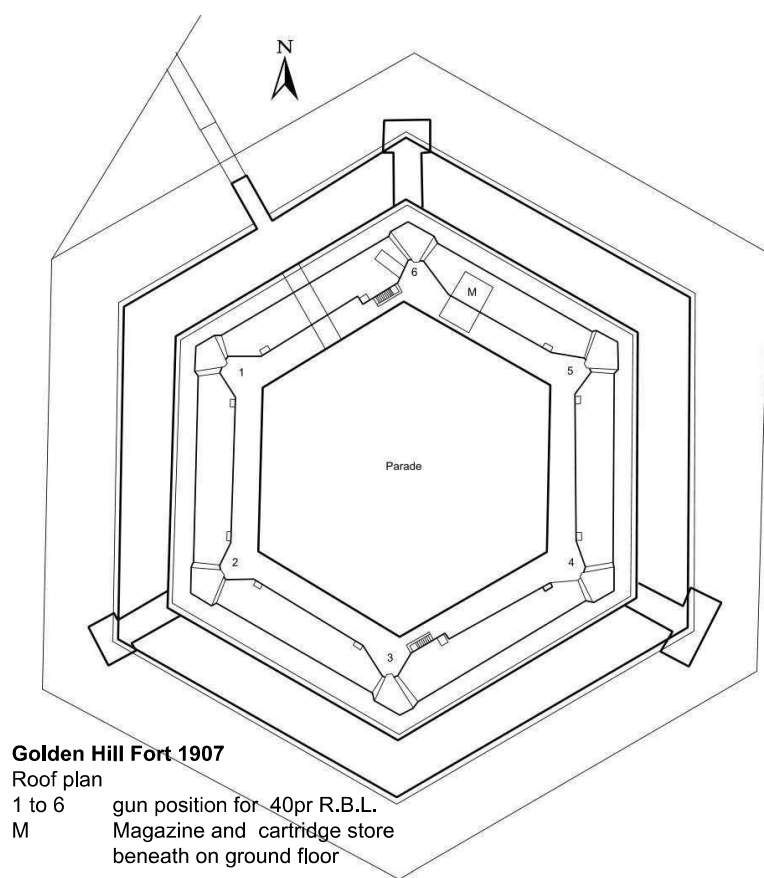
On the disbandment of Coast Artillery, all equipment was removed in January 1957 and the guns and mountings were cut up for scrap. Today the Forestry Commission owns the site which is heavily wooded: the emplacements, Battery Observation Post, engine room and nearby oil store survive, but public access is discouraged.

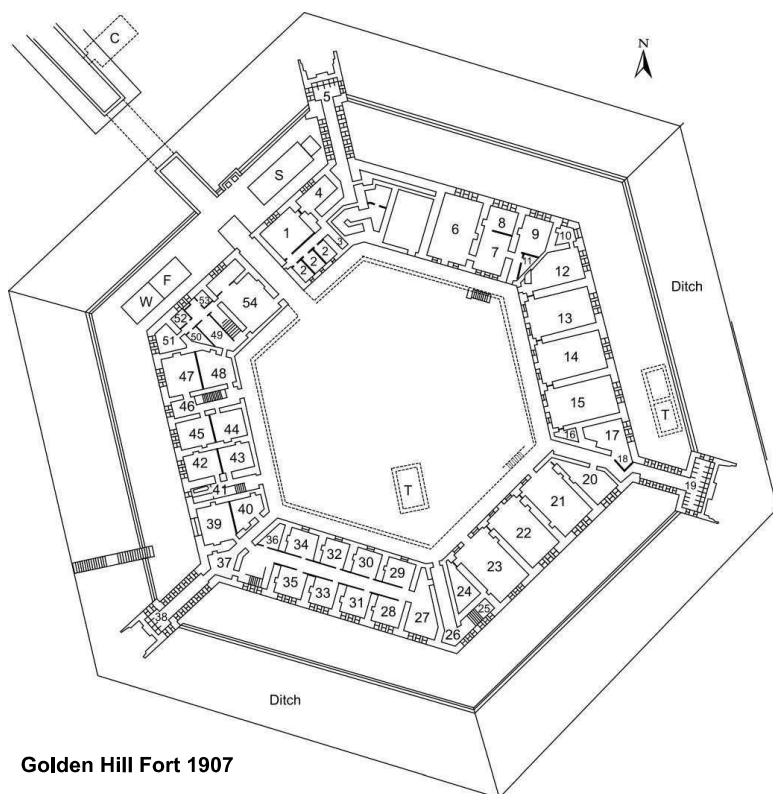
12. Golden Hill Fort (Ordnance Survey ref: SZ 339 879)

The 1859 Royal Commission recommended the building of a land fort between Cliff End and Freshwater to cover the new coast batteries in the West Wight against land assault from the east. It would also accommodate the two companies of gunners who would garrison the batteries in wartime, since few of the latter had barracks. The line of the River Yar would be covered by rooftop guns while reserves could counter landings on the coast. The 1860 report suggested a fort for 12 guns and 400 men at Hill Farm, soon renamed Golden Hill after the yellow laburnum bushes there. This became a firm plan for a fort with a barracks in the rear to hold 250 men, protected by a glacis on the west side. This proving too expensive, a smaller fort was designed in 1863 with a hexagonal defensible two-storey barrack to accommodate 8 officers, 128 other ranks and 14 hospital patients.

One-storey musketry caponiers flanked the ditch equidistantly at three salients. The fort was surrounded by a raised glacis which protected both storeys from shell fire. It was penetrated from the north by a brick-lined tunnel which gave access to the open area surrounding the barracks and to the courtyard of the fort. A glass-roofed verandah ran round three sides of the hexagonal courtyard at first-floor level. Supported on iron columns, it served the barrack rooms on the east side of the fort, each for 14 men. The main magazine was situated in the north-east corner on the ground floor. Initially, cartridges and shells were passed from the magazine via a handling room to a hoist which took them to the rooftop guns.

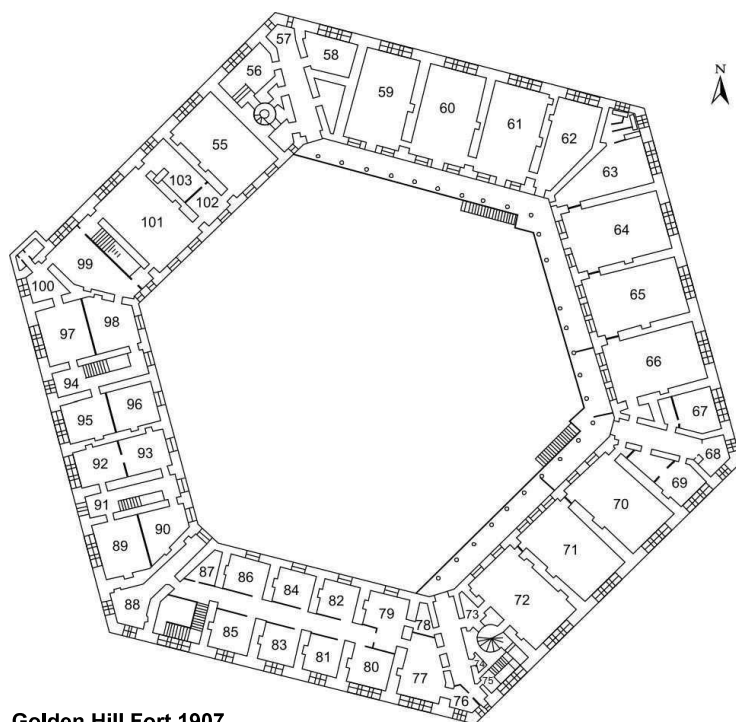
The original plan was for eighteen light guns on the roof, protected by earth parapets. Construction of the fort began in 1863 but problems occurred because both the glacis and roof parapets were formed of badly drained blue slipper clay. Three quarters of the inner part of the glacis slipped in 1864-66





Golden Hill Fort 1907

Ground Floor Plan



Golden Hill Fort 1907

Upper Floor Plan

Golden Hill Fort 1907**Ground Floor**

- 1 Guard Room
- 2 Detention Rooms
- 3 Heating chamber
- 4 Detention Room
- 5 Detention Latrines
- 6 Tap Room
- 7 Bar
- 8 NCOs Room
- 9 Dry Canteen
- 10 Lobby
- 11 Store
- 12 Cookhouse
- 13 Drying Room
- 14 Dining Room
- 15 No.1 Barrack Room 12 men
- 16 Store
- 17 Sergeants' Mess Kitchen
- 18 Pump Room
- 19 Men's Latrines
- 20 Wood Store
- 21 No.42 Barrack Room 12 men
- 22 School
- 23 No.3 Barrack Room 12 men
- 24 Wood Store
- 25 Wood Store
- 26 Potato Store
- 27 Women's Wash House
- 28 Company Store No.1
- 29 Company Office No.4
- 30 Company Office No.3
- 31 Company Store No.2
- 32 Company Office No.2
- 33 Company Store No. 3
- 34 Company Office No.1
- 35 Company Store No.4
- 36 Telephone Room
- 37 Mangle Room
- 38 Women's Latrines
- 39 Orderly Room
- 40 C.O. Office
- 41 W.C. Bathroom
- 42 Field Officer's Office
- 43 Officer's Quarter No.4
- 44 Officer's Servant Quarter No.1
- 45 Officer's Servant Quarter No.2
- 46 W.C.
- 47 Officer's Servant Quarter No.3
- 48 Mess Man's Quarters
- 49 Pantry
- 50 Beer
- 51 Waiter's Room
- 52 Larder
- 53 Wine
- 54 Officers' Mess Kitchen

Upper Floor

- 55 Billiard Room & Mess
- 56 N.C.O. 2
- 57 Paint Store
- 58 Armament Office
- 59 No.4 Barrack Room 12 men
- 60 No.5 Barrack Room 12 men
- 61 No.6 Barrack Room 12 men
- 62 No.7 Barrack Room 12 men
- 63 Ablution Room
- 64 No.8 Barrack Room 11 men
- 65 Barrack Room
- 66 Sergeants' Mess
- 67 Reading Room
- 68 Bath Room & W.C.s
- 69 Bar
- 70 Billiard Room
- 71 Barrack Room 12 men
- 72 Barrack Room 12 men
- 73 Pantry
- 74 Store
- 75 Urinal
- 76 Bread & Meat Store
- 77
- 78 Pantry
- 79 Kitchen
- 80 Store
- 81 Married Quarters No.8
- 82 Married Quarters No.8
- 83 Married Quarters No.7
- 84 Married Quarters No.7
- 85 Married Quarters No.6
- 86 Married Quarters No.6
- 87 Shop
- 88 Tailor
- 89 Officer's Quarter No.6
- 90 Field Officer's Kitchen
- 91 W.C.
- 92 Field Officer's Quarters
- 93 Field Officer's Quarters
- 94 W.C.
- 95 Officer's Quarter No.3
- 96 Officer's Quarter No.2
- 97 Officer's Quarter No.1
- 98 Ante Room No.1
- 99 Ante Room No.2
- 100 Dressing Room
- 101 Mess Room
- 102 Office
- 103 Pantry
- C Coal Store
- F Fire Engine
- S Skittle Alley
- W Wheeler's Shop
- T Tank

and a large part of the rooftop parapets collapsed into the ditch after heavy rain in 1868. Proper drainage and insertion of brushwood solved some of the problem, but occasional subsidence did occur thereafter. Instead of the planned rooftop armament, six 40-pounder RBLs were installed after 1872 in the salients on special sliding carriages. Recesses for shells and cartridges were provided in the brick parapets near the emplacements.

At first all ammunition was stored in the ground floor magazine. 40-pounder shells were hoisted to a first floor room near the north-east angle for fixing of the fuses, thence to the roof. By the 1890s, however, only cartridges were kept in the main magazine: the shells were stored in a room on the first floor to simplify fuse fixing. The hospital was located on the first floor in the southern part of the fort: since a wind-powered pump for raising water was built on the roof above in 1870 the patients can have enjoyed little rest!

The first troops moved into the fort that year. In 1888 it also became the Western District School of Gunnery and ran a whole series of courses for both Regular and Volunteer gunners. A drill shed and the School of Instruction were built north of the fort and a large number of store and accommodation huts were erected to the north-east. The School retained several different types of coast defence and field guns for instruction purposes, such as two 9-pounder RMLs and two 24-pounder SBs in the 1890s. The rooftop 40-pounders were removed about 1903 but by 1906 a moveable armament of

three Maxim machine guns and two 4.7-inch QF was stored at the fort to defend the Yar River line against land attack.

In 1897 a new hospital was built to the north of the drill shed, beyond the main road: married quarters were built nearby. In 1912 two of the three new hospital blocks were converted into quarters and a Mess for Royal Garrison Artillery officers. During the 1914-18 War, Golden Hill was also used as an infantry training depot, accommodating the recruits in a hutted camp around the Victorian fort. Over 30,000 men were trained for the Duke of Cornwall's Light Infantry there in 1915-18. Between the world wars infantry battalions and gunners continued to occupy the fort. An extra toilet block was built at the south angle in the 1920s. During the 1939-45 war, it again served as a depot for British and Canadian infantry, but in 1945 it was taken over by the RASC as a barrack for waterborne troops.

Postwar, their Water Transport Training Company and Junior NCO's Training School shared the fort until 1962, when the Army gave up the place. Two wooden huts in the courtyard were used as dining rooms. From 1969 to 1984 the fort was an industrial estate. It was open to the public for a while as a museum and craft centre, after considerable restoration. In 2003 the fort was again derelict. The School of Gunnery buildings outside are still used by light industry. In 2007 work was begun to convert the Fort to 18 modern apartments with the first one completed by March 2011.



Golden Hill Fort in 1989

Glossary of Military Terms

Barbette A battery position where the protective parapet is low enough for the gun to fire over it without the need for embrasures.

Bastion A projection from the walls of a fort whereby they could be covered with flanking fire. Bastions were usually composed of two faces meeting at a salient angle and joined to the main walls by straight flanks, though bastions in many forts of Henry VIII were semi-circular.

Battery Command (BC) Post Point from which the guns of a battery were commanded and directed.

Blocked-up When traversing platform was raised up on an iron central block so the gun fired over the parapet rather than through an embrasure it was 'blocked-up'.

Blockhouse Originally a Tudor fort, by Victorian times it meant an infantry strongpoint.

Bombproof A vaulted casemate or building covered with earth or concrete to withstand plunging shell fire.

Bore The inside of a gun barrel.

Breech-loader A gun which could be loaded by opening part of the breech (or rear) of the barrel.

Bring-to-Round A non-explosive round fired across the bows of a suspicious vessel by a coast battery to force her to heave to for inspection.

Calibre Diameter across the bore of a gun

Caponier A work defending a ditch with crossfire by extending across it.

Care and Maintenance Maintenance of coast guns after 1918 by civilians called District Gunners so they could be brought into immediate use at the outbreak of war.

Carronade Short-barrelled smooth-bore cannon often used to defend ditches of forts with case shot.

Casemate A bombproof vault of brick or stone, usually covered with earth, which provided an emplacement for a gun or living quarters for soldiers.

Case shot A cylinder of thin metal filled with cast-iron shot and fired from a gun as an anti-personnel measure.

Embrasure Opening in parapet or casemate front through which cannon could be fired.

Enfilade Fire directed from the flank of a fort so that projectiles will rake the length of a rampart without the garrison being able to reply.

Expose To switch on a searchlight.

Expense magazine A small magazine in which ready-to-use ammunition was stored near the guns. **Glacis** A sloping earth bank in front of the walls of a fortification, both to expose attacking infantry to defender's fire and to absorb shellfire.

Gorge The rear face of a fortification.

Grapeshot A number of small iron shot, held together inside the barrel of a gun, which spread on firing to kill infantry or gunners.

Keep The main tower of a medieval castle or a Tudor fort.

Muzzle-loader Any gun loaded from its front (muzzle) end.

Parados Rampart protecting the rear of a fortification.

Portcullis Grating which could be lowered in grooves cut in the walls of a gateway to defend the entrance.

Port War Signal Station A tower from which Royal Navy personnel challenged all vessels approaching a defended port.

Racer track Curved iron track set in the ground on which a gun is traversed.

Rampart Fortified embankment topped by a parapet.

Redoubt A small fort without bastions.

Refused flank A flank of a fort built at an obtuse angle to the main face so that it cannot be enfiladed.

Rifled gun A gun whose bore was cut along its axis with spiral grooves so as to spin an elongated shell and make its flight more accurate.

Sconce A detached fort with bastions.

Smooth-bore gun Gun barrel without rifling in the bore.

Sub-calibre A smaller gun mounted co-axially on (or even in) the barrel of a larger weapon for practice purposes.

Terreplein Broad level fighting platform on the rampart behind the parapet.

Territorial A civilian trained in his spare time as a soldier and liable to be called-up in wartime for home defence. The Territorial Force replaced the old Volunteers in 1908 and in turn became the Territorial Army in 1920. It fought proudly abroad in both World Wars.

Traverse (1) To swivel a gun and its carriage, usually to point them at a target. (2) An earth bank positioned so as to protect troops from enfilade fire or to minimise the affect of a bursting shell.

Traversing platform Wooden or metal platform which supported a gun and its carriage and which could be traversed on racer tracks.



Fort Victoria
During demolition in 1969

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W078/2663 Old Needles Battery 1860

3. New Needles Battery

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4. Hatherwood Battery

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11. Bouldnor Battery

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12. Golden Hill Fort

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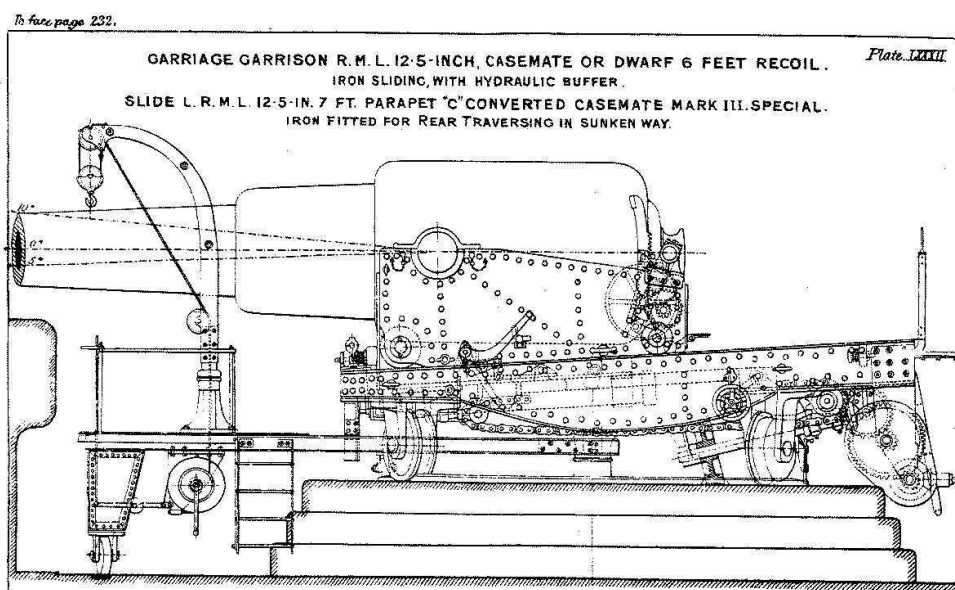
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Above: Fort Albert from the sea

Above Right: Fort Albert (Cliff End Fort) with Hurst Castle beyond looking North West: March 2011

Right: New Needles Battery in 2003

Below: New Needles Battery in 2018



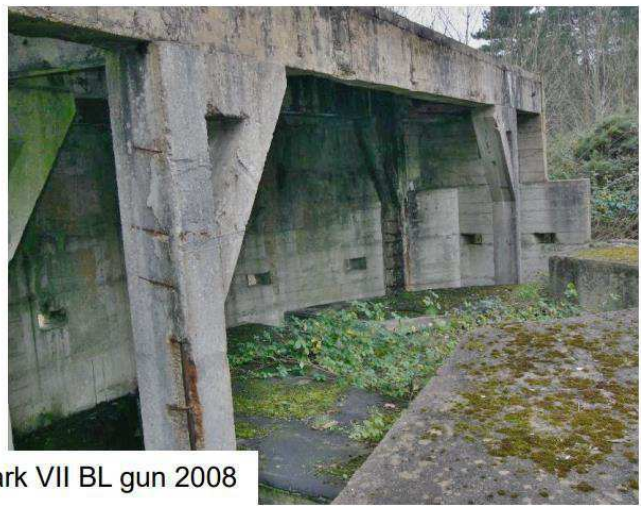
Interior of Golden Hill Fort: March 2011



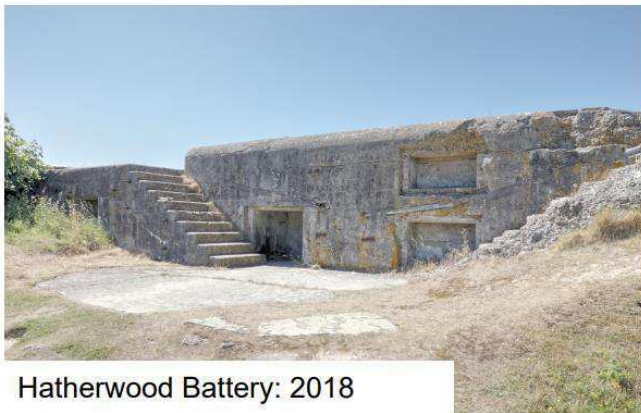
Fort Victoria: March 2011



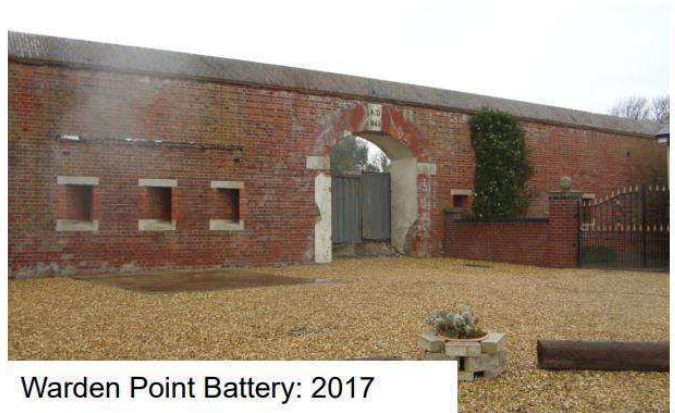
Bouldnor Battery: Gun emplacement for 6-inch Mark VII BL gun 2008



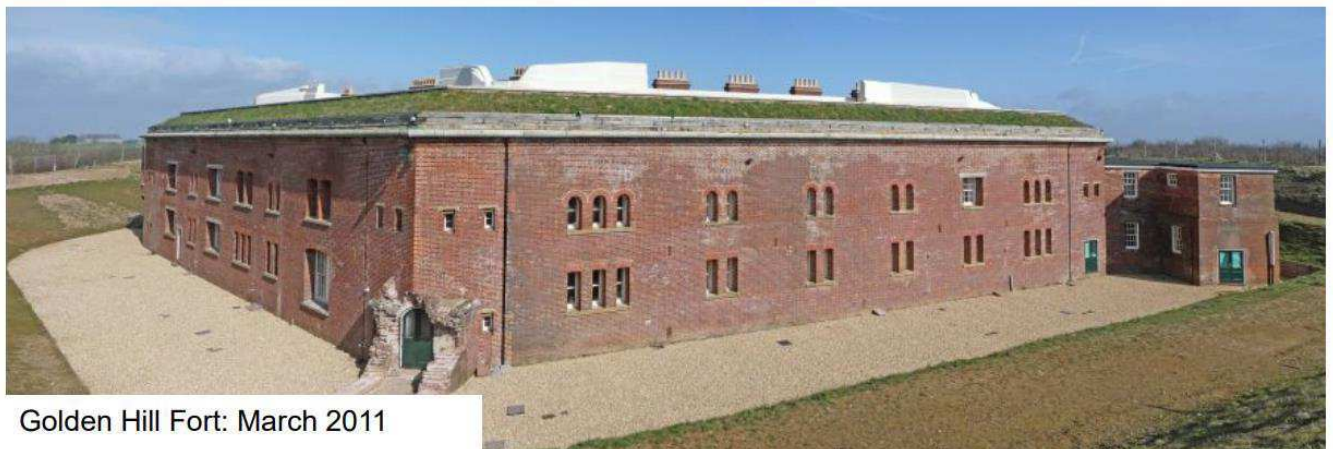
New Needles: 2018



Hatherwood Battery: 2018



Warden Point Battery: 2017



Golden Hill Fort: March 2011

